



INTERNATIONAL CODE COUNCIL

2012 – 2014 CODE
DEVELOPMENT CYCLE
Group C (2014)

PROPOSED CHANGES TO THE 2012 EDITIONS OF
THE INTERNATIONAL GREEN CONSTRUCTION CODE®

- General
- Energy/Water

April 27th – May 3rd, 2014
Memphis Cook Convention Center
Memphis, TN

First Printing

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By

International Code Council, Inc.

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INTRODUCTORY INFORMATION

(2014 Group C)



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INTRODUCTION

Welcome to cdpACCESS!

This 2014 Group C Cycle is the first cycle which is utilizing the new cdpACCESS system. This system allowed stakeholders to collaborate on potential code changes and ultimately was used to submit code changes online via the system. For more details please see cdpACCESS Updates, page xv.

The proposed changes published herein have been submitted in accordance with established procedures [Council Policy 28 Code Development (CP 28)] (see page xx) and are distributed for review. The publication of these changes constitutes neither endorsement nor question of them but is in accordance with established procedures so that any interested individuals may make their views known to the relevant code committee and others similarly interested. In furtherance of this purpose, the committee will hold an open public hearing at the date and place shown below for the purpose of receiving comments and arguments for or against such proposed changes. Those who are interested in testifying on any of the published changes are expected to be represented at these hearings.

This compilation of code change proposals is available in electronic form only. As part of ICC's green initiative, ICC no longer prints and distributes this document. The compilation of code change proposals will be posted on two locations on the ICC website: the customary posting which is linked from the [Code Development](#) webpage and from the [cdpACCESS webpage](#). CD copies will not be distributed, however ICC will have electronic versions available at the ICC Bookstore.

2014 ICC COMMITTEE ACTION HEARINGS

These proposed changes will be discussed in public hearings to be held on April 27th through May 3rd at the Memphis Cook Convention Center, Memphis, TN. The code committees will conduct their public hearings in accordance with the schedule shown on page xxxix.

MEMBERSHIP COUNCILS TO MEET PRIOR TO THE HEARINGS

Prior to the hearings, the Building Official, Fire Service, PMG Official and Sustainability Membership Councils will be holding meetings during the Saturday morning, April 26th/Sunday, April 27th time period. This has been identified on the hearing schedule that was posted March 3rd.

Attention Green Stakeholders: One of the agenda items for the Sustainability Membership Council meeting on Sunday morning will be a discussion on the advancement and adoption of the IgCC. Be sure to get your hearing preparation done early enough to be able to attend and participate prior to the hearings which start at 1:00 pm.

Consult the [Membership Councils](#) webpage for details as they become available.

REGISTRATION AND VOTING

New in 2014 is the change in process where assembly floor motions will be allowed following the committee action, however, the motion will be voted online following the hearings. All ICC members will be allowed to vote online on assembly floor motions. ICC members in attendance will still be allowed to vote on procedural "points of order" in accordance with Section 5.4.7 of CP 28 (see page xxvii). **For identification purposes, all hearing participants must register. There is no cost to register or participate in the hearings.** The registration desk will be open in the lobby of the convention center according to the following schedule:

Sunday, April 27 th	9:00 am to 5:00 pm
Monday, April 28 th through Friday, May 2 nd	7:30 am to 5:00 pm
Saturday, May 3 rd	7:30 am to 2:00 pm

CP 28 requires that ICC's membership records regarding ICC members reflect the eligible voters 30 days prior to the start of the Committee Action Hearings. This process includes new as well as changes to voting status. This

applies to all ICC Members - Governmental Members and non Governmental Members. Applicable CP 28 sections noted below:

5.7.4 Eligible Online Assembly Motion Voters: All members of ICC shall be eligible to vote on online assembly floor motions. Each member is entitled to one vote, except that each Governmental Member Voting Representative may vote on behalf of its Governmental Member. Individuals who represent more than one Governmental Member shall be limited to a single vote. Application, whether new or updated, for ICC membership must be received by the Code Council 30 days prior to the first day of the Committee Action Hearing. The ballot period will not be extended beyond the published period except as approved by the ICC Board.

9.2 Applications: Applications for Governmental Membership must be received by the ICC at least 30 days prior to the Committee Action Hearing in order for its designated representatives to be eligible to vote at the Public Comment Hearing or Online Governmental Consensus Vote. Applications, whether new or updated, for Governmental Member Voting Representative status must be received by the Code Council 30 days prior to the commencement of the first day of the Public Comment Hearing in order for any designated representative to be eligible to vote. An individual designated as a Governmental Member Voting Representative shall provide sufficient information to establish eligibility as defined in the ICC Bylaws. The Executive Committee of the ICC Board, in its discretion, shall have the authority to address questions related to eligibility.

As such, new membership applications as well as renewal applications must be received by ICC's Member Services Department by March 28th, 2014. These records will be used to verify eligible voter status. Members are strongly encouraged to review their membership records for accuracy well in advance of the hearings so that any necessary changes are made prior to the March 28th deadline. For information on application for new membership and membership renewal, please go to www.iccsafe.org/membership/join.html or call ICC Member Services at 1-888-ICC SAFE (422-7233)

ADVANCED REGISTRATION

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

CODE DEVELOPMENT PROCESS SCHEDULE

As noted in the posted Advisory Statement of February 4, 2009, the revised Code Development Process includes maintaining the current 3-year publication cycle with a single cycle of code development between code editions. The schedule for the 2012 -2014 Code Development Cycle is the first schedule for the revised code development process (see page xi).

PROCEDURES

The procedures for the conduct of the public hearing are published in CP 28 ("Procedures") on page xx. The attention of interested parties is specifically directed to Section 5.0 of the Procedures. These procedures indicate the conduct of, and opportunity to participate at the Committee Action Hearing. Please review these procedures carefully to familiarize yourself with the process.

There have been a number of revisions to the procedures prior to the start of the 2012 – 2014 Cycle. Also, with the implementation of cdpACCESS and corresponding changes to the process effective with the 2014 Cycle, significant changes were made to the procedures to account for the new submittal process and online voting opportunities. Included among these revisions are the following:

- Section 1.3.1 **Code Correlation.** This section institutionalizes the role of the Code Correlation Committee and the development and maintenance of the Code Scoping Coordination Matrix.

- Section 1.5 **Secretariat.** Staff has the authority to facilitate unforeseen situations which arise in the implementation of CP 28.
- Section 1.6 **Recording.** This section stipulates that ICC maintains sole ownership in the content of the hearings and has the right to control its subsequent distribution.
- Section 2.4 **Emergency Procedures.** This section includes a 'metric' to aid in the determination of when an issue rises to the level of concern appropriate to an emergency amendment. Furthermore, it now stipulates a process by which a proposed Emergency Amendment is reviewed by the ICC Codes and Standards Council who is responsible for the implementation and oversight of ICC's Code Development Process.
- Section 2.5 **Code Development Record.** Identifies the official documents and records for a cycle.
- Section 3.3.1
&
Section 6.4.1 **Proponent.** An e-mail address for each code change/public comment proponent will be published in the monograph, unless the proponent requests otherwise.
- Section 3.3.5.3
&
Section 6.4.5 **Substantiation.** ICC evaluates whether substantiating material is germane, but the policy makes it clear that ICC does not in all circumstances evaluate substantiating material for quality or accuracy.
- Section 3.3.5.6 **Cost Impact.** The proponent should submit information that supports their claim regarding cost impact. Any information submitted will be considered by the code development committee. This language is intended to emphasize the need to provide information on how the proposed change will affect the cost of construction.
- Section 3.4
&
Section 6.4.6 **Online Submittal.** Code changes and public comments are required to be submitted online via the cdpACCESS system.
- Section 3.6.3.1 **Standard Promulgation.** If a proposed new standard is not submitted in at least draft form, the corresponding code change proposal shall be considered incomplete and shall not be processed.
- Section 4.4 **Editorial Code Change Proposals.** Institutionalizes and revises the process by which the Code Correlation Committee considers staff identified editorial code changes. Code changes identified as editorial may be required to be considered via the entire process. (None identified for the 2014 Cycle).
- Section 4.6 **Updating Standards Referenced in the Codes.** The deadline for availability of updated referenced standards and receipt by the Secretariat is December 1st of the third year of each code cycle. For the 2012/2013/2014 cycle, the deadline is December 1, 2014.
- Section 5.2.2 **Conflict of Interest.** The determination as to whether or not a committee member should recuse themselves is left to the committee member. The only exception is where the committee member is also the proponent of the code change.
- Section 5.4.2 **Open Hearing.** A provision has been added that stipulates that participants shall not advocate a position on specific code changes with Committee Members other than through the methods provided in this policy.

- Section 5.4.3
&
Section 7.5.3 **Presentation of Material at the Public Hearing.** All participants are to make it clear what interests they are representing. This disclosure provides additional information upon which to evaluate the testimony.
- Section 5.5.2.1 **Submission (Modifications).** In anticipation of the new cdpACCESS online system, this section was revised to reflect that modifications will be submitted electronically while at the hearing. Unfortunately, this feature is still under development and will not be available for this cycle.
- Sections 5.7 –
5.7.5 **Assembly consideration.** Assembly floor motions made at the Committee Action Hearing will not be voted on at the hearing. They will be voted on via an online process following the hearing (5.7.2). The process will include the ability to view the video of the hearing testimony, committee deliberations and committee action (5.7.3). Each member, including Governmental Member Voting Representatives, gets only one vote (5.7.4). A successful assembly action requires a majority of votes cast, will not be the initial motion at the Public Comment Hearing and will be considered as an automatic public comment (5.7.5 & 7.4). (see page vi)
- Section 5.8 **Report of the Committee Action Hearing.** This report will include all the actions taken at the hearing as well as the results of the online assembly vote, including vote counts.
- Section 6.5.3 **Deadline.** This section now includes a provision where-by the Code Correlation Committee is provided the opportunity to submit public comments to be considered at the Public Comment Hearing in order to facilitate code change coordination where a public comment was not submitted. Otherwise, the code change would have been placed on the consent agenda without an opportunity to coordinate with items on the individual consideration agenda.
- Sections 7.5.8 **Discussion and Voting (at the Public Comment Hearing).** Voting on main motions will occur electronically with the vote recorded and assigned to the eligible voting member (7.5.8.7). Subsequent motions for Disapproval are not in order as that is addressed where a majority vote is not achieved (7.5.8.8, 7.5.8.9). The posted results will include the vote counts. (7.5.8.10)
- Section 8.0 **Online Governmental Consensus Vote.** An entire new process following the Public Comment Hearing (PCH) where eligible voters can vote online.
- Section 9.0 **Eligible Final Action Voters.** This section requires that all Governmental Member applications must be received by 30 days prior to the Committee Action Hearings. For the 2014 Cycle, this date is March 28th (see page ii). All eligible voters must be confirmed via ICC's Electronic Voter Validation System.
- Section 10.0 **Tabulation, Certification and Posting of Results.** With the new Online Governmental Consensus Vote, security and validation of results is of paramount importance. This section outlines the steps to ensure fairness within the process. The final action results will be posted for each code change and include the tabulated vote counts from both the Public Comment Hearing and the Online Governmental Consensus Vote.
- Section 11.0 **Code Publication.** This section identifies the role and authority of the Code Correlation Committee to resolve coordination issues between code changes.
- Section 12.0 **Appeals.** With the new cdpACCESS process, this section defines actions or inactions that are not appealable.
- Section 13.0 **Violations.** This section notes the authority of the ICC Board to take whatever action necessary to maintain the integrity of the code development process.

SIGNIFICANT CHANGES TO THE ASSEMBLY ACTION PROCESS

The procedures regarding assembly consideration at the Committee Action Hearing have been revised (see Section 5.7 of CP 28 on page xxviii). Some important items to note regarding assembly consideration are:

- After the committee decision on a code change proposal is announced by the moderator, anyone in the assembly may make a floor motion for assembly action (5.7.1).
- After a floor motion for assembly action is made and seconded, the moderator will accept the motion and notify the attendees that the motion will be considered via an online voting process by all ICC members (5.7.2 and 5.7.4). No additional testimony will be permitted.
- Assembly floor motions will be voted on via an online process following the hearing (5.7.2).
- The online voting process will include the ability to view the video of the hearing testimony, committee deliberations and committee action (5.7.3). Each member, including Governmental Member Voting Representatives, gets only one vote (5.7.4). A successful assembly action requires a majority of votes cast, will not be the initial motion at the Public Comment Hearing and will be considered as an automatic public comment (5.7.5).
- A code change proposal that receives a successful assembly action will be placed on the Public Comment Agenda for individual consideration (7.4).

2012 – 2014 Cycle
GROUP A, GROUP B AND GROUP C CODE CHANGES

Note that, for code changes submitted to the 2012 I-Codes for the development of the 2015 Edition of the I-Codes, there will be three groups of code development committees and they will meet in separate years. The groupings are as follows:

Group A Codes (Heard in 2012)	Group B Codes (Heard in 2013)	Group C Codes (Heard in 2014)
<i>International Building Code Committees: IBC-Fire Safety (Chapters: 7- 9, 14, 26 and App. D) IBC-General (Chapters: 2-6, 12, 13, 27-34, App. A, B, C, F, H, K) IBC-Means of Egress (Chapters: 10, 11 and App. E) IBC-Structural (Chapters: 15-25 and App. G,I, J, L, M)</i>	<i>Administrative Provisions (Chapter 1 all codes except IgCC, IRC, IECC , ISPSC, Performance Code, designated definitions, and administrative update of referenced standards, including administrative updates of referenced standards in IgCC)</i> <i>(Administrative Code Committee)</i>	<i>International Green Construction Code Committees: IgCC—Energy/Water Committee (Chapters: 6 and 7) IgCC—General Committee (Chapters:2-5, 8-11 and Appendices)</i>
<i>International Fuel Gas Code (IFGC Committee)</i>	<i>International Energy Conservation Code (Commercial Energy Committee – see Note) (Residential Energy Committee – see Note)</i>	
<i>International Mechanical Code (IMC Committee)</i>	<i>International Existing Building Code (IEBC Committee)</i>	
<i>International Plumbing Code (IPC Committee)</i>	<i>International Fire Code (IFC Committee)</i>	
<i>International Private Sewage Disposal Code (IPC Committee)</i>	<i>International Performance Code (ICC Performance Code Committee)</i>	
	<i>International Property Maintenance Code (IPMC/IZC Committee)</i>	
	<i>International Wildland-Urban Interface Code (IFC Committee)</i>	
	<i>International Zoning Code (IPMC/IZC Committee)</i>	
	<i>International Residential Code Committees: IRC-B (Chapters: 1-10 and App. E, F, G,H, J, K, L, M, O) IRC-M/P (Chapters: 12-33 and App. I, P) IRC-E (Chapter 11 – see Note)</i>	
	<i>International Swimming Pool and Spa Code (ISPSC) Committee</i>	

NOTE: Residential Energy Committee is responsible for Chapter 11 of the IRC and the Residential Provisions of the IECC.

2014 GROUP C CODE DEVELOPMENT COMMITTEE RESPONSIBILITIES

Some sections of the International Codes have a letter designation in brackets in front of them. For instance, Section 415.1 of the IBC has a [F] in front of it, meaning that this section is the responsibility of the IFC Code Development Committee.

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

This is an informational item since the 2012 IgCC does not have any letter designations in brackets in front of any of the section numbers since the 2012 edition was published after the initiation of the 2012 Group A Cycle. This will change in the 2015 IgCC.

A complete summary of the Group A, Group B and Group C Code Development Committees' responsibilities can be viewed at the ICC Website: http://www.iccsafe.org/cs/codes/Documents/2012-13cycle/GroupA-B_CDC-Responsibilities.pdf.

A similar summary of Code Development Committee responsibilities will be posted for the 2015 – 2017 Cycle.

ANALYSIS STATEMENTS

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

NEW REFERENCE STANDARDS

Proposed changes that include the addition of a reference to a new standard (i.e. a standard that is not currently referenced in the I-Codes.) will include in the proposal the number, title and edition of the proposed standard. This identifies to all interested parties the precise document that is being proposed and which would be included in the referenced standards chapter of the code if the proposed change is approved. Section 3.6.3.1 of CP 28 requires that a code change proposal will not be processed unless a consensus draft of the standard has been provided. Proponents of code changes which propose a new standard have been directed to forward copies of the standard to the code development committee. An analysis statement will be posted on the ICC website providing information regarding standard content, such as enforceable language, references to proprietary products or services, and references to consensus procedure. The analysis statements for referenced standards will be posted on or before April 1, 2014. This information will also be published and made available at the hearings.

REFERENCED STANDARDS UPDATES

Updates to currently referenced standards in any of the 2012 Codes were previously considered by the Administrative Code Development Committee in the 2013 Group B Cycle. The code change was ADM62-13.

It should be noted that, in accordance with Section 4.6 of CP 28, standards promulgators will have until December 1, 2014 to finalize and publish any updates to standards in the administrative update. If the standard update is not finalized and published by December 1, 2014, the respective I-Codes will be revised to reference the previously listed year edition of the standard.

MODIFICATIONS

Modification note: In anticipation of the new cdpACCESS online system, CP 28 was revised to reflect that modifications would be submitted electronically while at the hearing. This feature is still under development and will not be available for this cycle.

Those who are submitting a modification for consideration by the respective Code Development Committee are required to submit a Copyright Release in order to have their modifications considered (Section 3.3.5.5 of CP 28). It is preferred that such release be executed in advance. Copies of the form can be downloaded from the 2014 Group C schedule at: <http://www.iccsafe.org/cs/codes/Pages/cycle.aspx>. Copyright release forms will also be available at the hearings.

Please be sure to review Section 5.5.2 of CP #28 for the modification process. The Chair of the respective code development committee rules a modification in or out of order. Note that this is a procedural ruling to determine if the modification is to be permitted to be considered at the hearing. It is not a technical ruling. That ruling is final, with no challenge allowed.

The proponent submitting a modification is required to supply 20 printed copies. The minimum font size must be 16 point.

Example:

Original code change proposal.

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

PM10-13 305.13

Proponent: John West representing self

Revise as follows:

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

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

Proposed modification:

A modification to the code change proposal is proposed:

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

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

Example of proposed modification:

PM10-13
305.13

Modification Proponent: Sam Sumter representing self

Modify the proposal as follows:

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

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

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

CODE CORRELATION COMMITTEE

In a typical code change cycle, there are code change proposals that are strictly editorial. As noted in Section 4.4 of CP28, there is an established process by which the Code Correlation Committee considers such proposals. There are no editorial proposals in the current cycle.

ICC WEBSITE

This document is posted on the ICC Website – see the link on page iii. While great care has been exercised in the publication of this document, errata to proposed changes may occur. Errata, if any, will be identified in updates posted prior to the Code Development Hearings on the ICC website. Users are encouraged to periodically review the ICC Website for updates to the 2012 - 2014 Code Development Cycle-Group C (2014) Proposed Changes. Additionally, analysis statements for code changes which propose a new referenced standard will be updated to reflect the staff review of the standard for compliance with Section 3.6 of the Procedures.

PROPONENT CONTACT INFORMATION

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

2012 - 2014 ICC CODE DEVELOPMENT SCHEDULE

STEP IN CODE DEVELOPMENT CYCLE	DATE		
	2012 – Group A Codes IBC, IFGC, IMC, IPC, IPSDC	2013 – Group B Codes Admin, ICCPC, IEBC, IECC, IFC, IPMC, IRC, ISPSC, IWUIC, IZC	2014 – Group C Code IgCC
2012 EDITION OF I-CODES PUBLISHED	April 30, 2011		March 31, 2012
DEADLINE FOR RECEIPT OF APPLICATIONS FOR ALL CODE COMMITTEES	June 1, 2011 for the 2012/2013/2014 Cycle (updated to July 1 for IECC and IRC – Energy; August 1 for IgCC and ISPSC) June 2, 2014 for the 2015/2016/2017 Cycle. Call for committee posted January 31, 2014.		
DEADLINE FOR RECEIPT OF CODE CHANGE PROPOSALS	January 3, 2012	January 3, 2013	January 10, 2014
WEB POSTING OF “PROPOSED CHANGES TO THE I-CODES”	March 12, 2012	March 11, 2013	March 10, 2014
DISTRIBUTION DATE OF “PROPOSED CHANGES TO THE I-CODES” (CD only)	April 2, 2012	April 1, 2013	Online access via the ICC website and cdpACCESS only. Electronic version available at the ICC Bookstore.
COMMITTEE ACTION HEARING (CAH)	April 29 – May 6, 2012 Sheraton Dallas Hotel Dallas, TX	April 21 – 30, 2013 Sheraton Dallas Hotel Dallas, TX	April 27 – May 3, 2014 Memphis Cook Convention Center Memphis, TN
WEB POSTING OF “REPORT OF THE COMMITTEE ACTION HEARING”	June 8, 2012	May 31, 2013	June 6, 2014
DISTRIBUTION DATE OF “REPORT OF THE COMMITTEE ACTION HEARING” (CD only)	June 29, 2012	June 21, 2013	June 27, 2014
DEADLINE FOR RECEIPT OF PUBLIC COMMENTS	August 1, 2012	July 15, 2013	July 16, 2014
WEB POSTING OF PUBLIC COMMENTS “PUBLIC COMMENT AGENDA”	September 10, 2012	August 28, 2013	August 27, 2014
DISTRIBUTION DATE OF “PUBLIC COMMENT AGENDA” (CD only)	October 1, 2012	September 16, 2013	Online access via the ICC website and cdpACCESS only. Electronic version available at the ICC Bookstore

STEP IN CODE DEVELOPMENT CYCLE	DATE		
	2012 – Group A Codes IBC, IFGC, IMC, IPC, IPSDC	2013 – Group B Codes Admin, ICCPC, IEBC, IECC, IFC, IPMC, IRC, ISPSC, IWUIC, IZC	2014 – Group C Code IgCC
PUBLIC COMMENT HEARING (PCH) ANNUAL CONFERENCE DATES NOTED BY AC	October 24 – 28, 2012 Oregon Convention Center Portland, OR AC: October 21 - 24	October 2 – 10, 2013 Atlantic City Convention Center Atlantic City, NJ AC: September 29 – October 2	October 1 – 7, 2014 Greater Fort Lauderdale Broward County Convention Center Fort Lauderdale, FL AC: September 28 – October 1

Notes:

- This schedule utilizes the revised hearing terms noted in the cdp ACCESS report, as follows:

<p><u>Old term</u></p> <p>Code Development Hearing</p> <p>Report of the Public Hearing</p> <p>Final Action Agenda</p> <p>Final Action Hearing</p>	<p><u>Revised term</u></p> <p>Committee Action Hearing</p> <p>Report of the Committee Action Hearing</p> <p>Public Comment Agenda</p> <p>Public Comment Hearing</p>
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2012 - 2014 STAFF SECRETARIES

GROUP A (2012)

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

GROUP B (2013)

ADMINISTRATIVE Chapter 1 All Codes Except IRC	IEBC	IECC-Commercial	IECC-Residential	IFC
Kim Paarlberg ICC Indianapolis Field Office 1-888-ICC-SAFE, ext 4306 FAX: 708/799-0320 kpearlberg@iccsafe.org	Beth Tubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org	Kermit Robinson Whittier Office 1-888-ICC-SAFE, ext 3317 FAX: 562/699-4522 dmeyers@iccsafe.org	Dave Bowman ICC Chicago District Office 1-888-ICC-SAFE, ext 4323 FAX: 708/799-0320 dmeyers@iccsafe.org	Bill Rehr/ Beth Tubbs ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehre@iccsafe.org btubbs@iccsafe.org
ICC PC	IPMC	IRC-Building	IRC Mechanical	IRC Plumbing
Beth Tubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org	Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	Larry Franks/ Allan Bilka ICC Birmingham District Office 1-888-ICC-SAFE, ext 5279 FAX: 205/592-7001 lfranks@iccsafe.org abilka@iccsafe.org	Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org
ISPSC	IWUIC	IZC		
Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	Bill Rehr ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehre@iccsafe.org	Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org		

2012 - 2014 STAFF SECRETARIES (continued)

GROUP C (2014)

IgCC-General	IgCC-Energy/Water
Allan Bilka ICC Chicago District Office 1-888-ICC-SAFE, ext 4326 FAX: 708/799-0320 abilka@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org

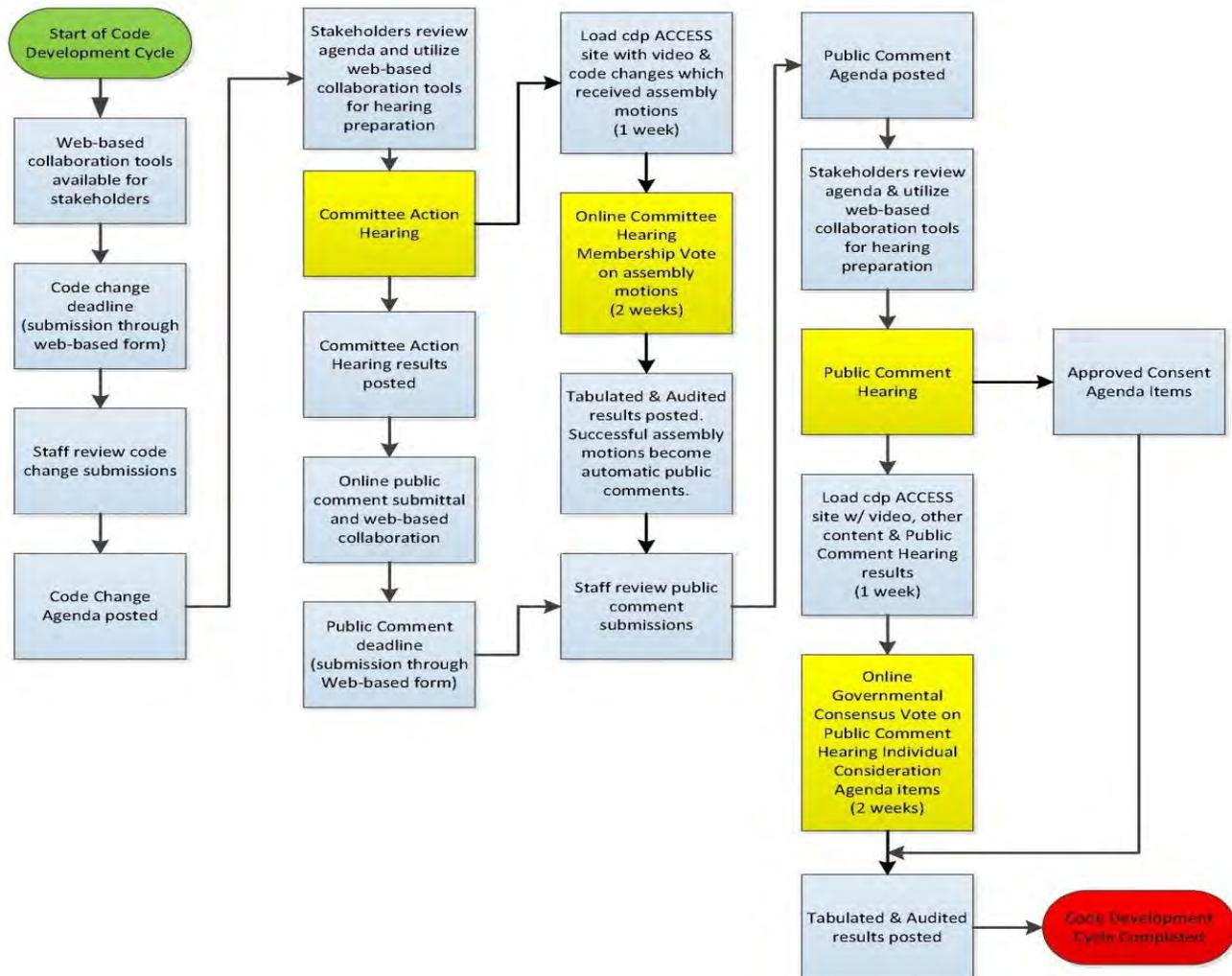
cdpACCESS Update

The development of cdpACCESS continues in support of the new process steps in the 2014 Cycle. The upcoming new features include:

- Customized code change monograph features where stakeholders can log onto the system and identify select code changes and create customized monograph
- The Online Assembly Floor Motion Voting process which follows the Committee Action Hearing
- Collaboration features in support in the public comment development
- The online public comment submittal process
- The use of electronic voting devices at the Public Comment Hearing which record the vote of the eligible voting member
- The Online Governmental Consensus Voting process which follows the Public Comment Hearing

ICC has also created a You Tube video that lasts about one hour. Be sure to check this out as well as additional information a: http://www.iccsafe.org/cs/cdpACCESS/Pages/def_ault.aspx

cdp ACCESS Flow Chart



2015 – 2017 CYCLE UPDATE

Call for Committee

A Call for Committee in support of the 2015 – 2017 Cycle was posted January 31, 2014 for the following committees:

- All 18 Code Development Committees, including the IgCC –General and IgCC – Energy/Water committees
- All 5 Interpretation Committees
- The Code Correlation Committee

The application deadline is June 2, 2014. All current committee members must re-apply to be considered. The link to the call is: <http://www.iccsafe.org/cc/Pages/calls.aspx>

Group A, Group B and Group C Code Groupings

The code groupings for the 2015 – 2017 Cycle have been revised from the 2012 – 2014 Cycle as follows.

Codes moved to Group A, to be considered in the 2015 Cycle:

- IEBC non-structural provisions
- IPMC
- IRC – Mechanical
- IRC – Plumbing
- ISPSC
- IZC

Codes moved to Group B, to be considered in the 2016 Cycle:

- IBC – Structural has been moved to Group B. This includes the structural provisions of the IEBC.

See page xvii for the 2015 – 2017 ICC Code Development Schedule

Code Scoping Coordination Matrix

The current 2012 – 2014 Group A, Group B and Group C Code Development Committees responsibilities matrix is being updated for the 2015 – 2017 Cycle and will be linked from the ICC Code Development webpage as well as cdpACCESS. This matrix will reflect the updated Code Groupings noted above.

**2015/2016/2017 ICC CODE DEVELOPMENT SCHEDULE
(March 3, 2014)**

STEP IN CODE DEVELOPMENT CYCLE	DATE		
	2015 – Group A Codes IBC- E, IBC - FS, IBC -G, IEBC, IFGC, IMC, IPC, IPMC, IPSDC, IRC – M, IRC- P, ISPSC, IZC	2016 – Group B Codes Admin, IBC-S, IECC-C, IECC/IRC-R, IFC, IRC - B, IWUIC	2017 – Group C Code IgCC
2015 EDITION OF I-CODES PUBLISHED	June 2, 2014 (approx.)		March 31, 2015 (approx.)
DEADLINE FOR RECEIPT OF APPLICATIONS FOR ALL CODE COMMITTEES	June 2, 2014 for the 2015/2016/2017 Cycle. Call for committee posted January 31, 2014 June 1, 2017 for the 2018/2019/2020 Cycle. Call for committee to be posted in January/2017.		
DEADLINE FOR cdpACCESS ONLINE RECEIPT OF CODE CHANGE PROPOSALS	January 12, 2015	January 11, 2016	January 9, 2017
WEB POSTING OF “PROPOSED CHANGES TO THE I-CODES”	March 13, 2015	TBD	TBD
COMMITTEE ACTION HEARING (CAH)	April 26 – May 3, 2015 Memphis Cook Convention Center Memphis, TN	April/2016 TBD	April/2017 TBD
ONLINE CAH ASSEMBLY FLOOR MOTION VOTING PERIOD	Starts approx. one week after last day of CAH. Open for 1 week.	Starts approx. one week after last day of CAH. Open for 1 week.	Starts approx. one week after last day of CAH. Open for 1 week.
WEB POSTING OF “REPORT OF THE COMMITTEE ACTION HEARING”	June 5, 2015	TBD	TBD
DEADLINE FOR cdpACCESS ONLINE RECEIPT OF PUBLIC COMMENTS	July 17, 2015	TBD	TBD
WEB POSTING OF “PUBLIC COMMENT AGENDA”	August 28, 2015	TBD	TBD

STEP IN CODE DEVELOPMENT CYCLE	DATE		
	2015 – Group A Codes IBC- E, IBC - FS, IBC -G, IEBC, IFGC, IMC, IPC, IPMC, IPSDC, IRC – M, IRC- P, ISPSC, IZC	2016 – Group B Codes Admin, IBC-S, IECC-C, IECC/IRC-R, IFC, IRC - B, IWUIC	2017 – Group C Code IgCC
PUBLIC COMMENT HEARING (PCH) ANNUAL CONFERENCE DATES NOTED BY AC	September 30 – October 7, 2015 Long Beach Convention Center Long Beach, CA AC: September 27 - 30	October 19 – 25, 2016 Kansas City Convention Center Kansas City, MO AC: October 16 – 18	October 25 – 31, 2017 Greater Columbus Convention Center Columbus, OH AC: October 22 – 24
ONLINE GOVERNMENTAL CONSENSUS VOTING PERIOD	Starts approx. one week after last day of PCH. Open for 2 weeks.	Starts approx. one week after last day of PCH. Open for 2 weeks.	Starts approx. one week after last day of PCH. Open for 2 weeks.

Group A Codes:

- IBC-E: IBC Egress provisions. Chapters 10 and 11
- IBC-FS: IBC Fire Safety provisions. Chapters 7, 8, 9 (partial), 14 and 26. Majority of IBC Chapter 9 maintained by the IFC in Group B. See notes.
- IBC-G: IBC General provisions. Chapters 3 – 6, 12, 13, 27 – 33
- IEBC: IEBC non structural provisions. See notes.
- IFGC
- IMC
- IPC
- IPMC
- IPSDC
- IRC-M: IRC Mechanical provisions. Chapters 12 - 23
- IRC-P: IRC Plumbing provisions. Chapters 25 - 33
- ISPSC
- IZC

Group B Codes:

- Admin: Chapter 1 of all the I-Codes except the IECC and IRC. Also includes the update of currently reference standards in the 2015 Codes
- IBC-S: IBC Structural provisions. IBC Chapters 15 – 25 and IEBC structural provisions. See notes.
- IECC-C: IECC Commercial energy provisions.
- IECC/IRC-R: IECC Residential energy provisions and IRC Energy provisions in Chapter 11
- IFC: The majority of IFC Chapter 10 maintained by IBC-E in Group A. See notes.
- IRC-B: IRC Building provisions. Chapters 1 – 10.
- IWUIC

Group C Codes:

- IgCC

Notes:

- Be sure to review the document entitled “2015/2016/2017 Code Committee Responsibilities” which will be posted. This identifies responsibilities which are different than Group A, B and C codes and committees which may impact the applicable code change cycle and resulting code change deadline. As an example, throughout Chapter 9 of the IBC (IBC- Fire Safety, a Group A code committee), there are numerous sections which include a “[F]” which indicates that the provisions of the section are maintained by the IFC code committee (a Group B code committee). Similarly, there are numerous sections in the IEBC which include a “[B]”. These are structural provisions which will be heard in Group B by the IBC – Structural committee while the non structural provisions will be maintained in the 2015 Group A Cycle. This is also indicated in the Code Committee Responsibilities document.
- Proposed changes to the ICC Performance Code will be heard by the Code Development Committee noted in brackets [] in the text of the code.
- Definitions. Be sure to review the brackets in the code in Chapter 2 of the applicable code in conjunction with the Code Development Responsibilities document noted above to determine which Code Development Committee will consider proposed changes to definitions.



CP #28-05 CODE DEVELOPMENT

Approved: 9/24/05

Revised: 9/28/13

1.0 Introduction

- 1.1 **Purpose:** The purpose of this Council Policy is to prescribe the Rules of Procedure utilized in the continued development and maintenance of the International Codes (Codes).
- 1.2 **Objectives:** The ICC Code Development Process has the following objectives:
 - 1.2.1 The timely evaluation and recognition of technological developments pertaining to construction regulations.
 - 1.2.2 The open discussion of code change proposals by all parties desiring to participate.
 - 1.2.3 The final determination of Code text by public officials actively engaged in the administration, formulation or enforcement of laws, ordinances, rules or regulations relating to the public health, safety and welfare and by honorary members.
 - 1.2.4 The increased participation of all parties desiring to participate through an online submittal and voting process that includes opportunities for online collaboration.
- 1.3 **Code Publication:** The ICC Board of Directors (ICC Board) shall determine the title and the general purpose and scope of each Code published by the ICC.
 - 1.3.1 **Code Correlation:** The provisions of all Codes shall be consistent with one another so that conflicts between the Codes do not occur. A Code Scoping Coordination Matrix shall determine which Code shall be the primary document, and therefore which code development committee shall be responsible for maintenance of the code text where a given subject matter or code text could appear in more than one Code. The Code Scoping Coordination Matrix shall be administered by the Code Correlation Committee as approved by the ICC Board. Duplication of content or text between Codes shall be limited to the minimum extent necessary for practical usability of the Codes, as determined in accordance with Section 4.5.
- 1.4 **Process Maintenance:** The review and maintenance of the Code Development Process and these Rules of Procedure shall be by the ICC Board. The manner in which Codes are developed embodies core principles of the organization. One of those principles is that the final content of the Codes is determined by a majority vote of the governmental and honorary members. It is the policy of the ICC Board that there shall be no change to this principle without the affirmation of two-thirds of the governmental and honorary members responding.
- 1.5 **Secretariat:** The Chief Executive Officer shall assign a Secretariat for each of the Codes. All correspondence relating to code change proposals and public comments shall be addressed to the Secretariat. The Secretariat shall have the authority to facilitate unforeseen situations which arise in the implementation of this council policy. Staff shall maintain a record of such actions.
- 1.6 **Recording:** Individuals requesting permission to record any meeting or hearing, or portion thereof, shall be required to provide the ICC with a release of responsibility disclaimer and shall acknowledge that ICC shall retain sole ownership of the recording, and that they have insurance coverage for liability and misuse of recording materials. Equipment and the process used to

record shall, in the judgment of the ICC Secretariat, be conducted in a manner that is not disruptive to the meeting. The ICC shall not be responsible for equipment, personnel or any other provision necessary to accomplish the recording. An unedited copy of the recording shall be forwarded to ICC within 30 days of the meeting. Recordings shall not otherwise be copied, reproduced or distributed in any manner. Recordings shall be returned to ICC or destroyed upon the request of ICC.

2.0 Code Development Cycle

2.1 Intent: The code development cycle shall consist of the complete consideration of code change proposals in accordance with the procedures herein specified, commencing with the deadline for submission of code change proposals (see Section 3.5) and ending with publication of the Final Action on the code change proposals (see Section 10.4).

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

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

2.4 Emergency Action Procedures:

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

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

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

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

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

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

2.5 Code Development Record. The code development record shall include the official documents and records developed in support of the given code development cycle. This includes the following:

1. Code Change Agenda (Section 4.8)
2. Audio and video recording of the Committee Action Hearing (Section 5.1)
3. The Online Assembly Floor Motion Ballot (Section 5.7.3)
4. Report of the Committee Action Hearing (Section 5.8)
5. Public Comment Agenda (Section 6.6)
6. Public Comment Hearing results (Section 7.5.8.10)
7. Audio and video recording of the Public Comment Hearing (Section 7.1)
8. The Online Governmental Consensus Ballot (Section 8.2)

- 9. Final Action results (Section 10.4)
- 10. Errata to the documents noted above

The information resulting from online collaboration between interested parties shall not be part of the code development record.

3.0 Submittal of Code Change Proposals

- 3.1 **Intent:** Any interested person, persons or group may submit a code change proposal which will be duly considered when in conformance to these Rules of Procedure.
- 3.2 **Withdrawal of Proposal:** A code change proposal may be withdrawn by the proponent (WP) at any time prior to public comment consideration of that proposal. All actions on the code change proposal shall cease immediately upon the withdrawal of the code change proposal.
- 3.3 **Form and Content of Code Change Submittals:** Each code change proposal shall be submitted separately and shall be complete in itself. Each submittal shall contain the following information:
 - 3.3.1 **Proponent:** Each code change proposal shall include the name, title, mailing address, telephone number, and email address of the proponent. Email addresses shall be published with the code change proposals unless the proponent otherwise requests on the submittal form.
 - 3.3.1.1 If a group, organization or committee submits a code change proposal, an individual with prime responsibility shall be indicated.
 - 3.3.1.2 If a proponent submits a code change proposal on behalf of a client, group, organization or committee, the name and mailing address of the client, group, organization or committee shall be indicated.
 - 3.3.2 **Code Reference:** Each code change proposal shall relate to the applicable code sections(s) in the latest edition of the Code.
 - 3.3.2.1 If more than one section in the Code is affected by a code change proposal, appropriate proposals shall be included for all such affected sections.
 - 3.3.2.2 If more than one Code is affected by a code change proposal, appropriate proposals shall be included for all such affected Codes and appropriate cross referencing shall be included in the supporting information.
 - 3.3.3 **Multiple Code Change Proposals to a Code Section.** A proponent shall not submit multiple code change proposals to the same code section. When a proponent submits multiple code change proposals to the same section, the proposals shall be considered as incomplete proposals and processed in accordance with Section 4.3. This restriction shall not apply to code change proposals that attempt to address differing subject matter within a code section.
 - 3.3.4 **Text Presentation:** The text of the code change proposal shall be presented in the specific wording desired with deletions shown struck out with a single line and additions shown underlined with a single line.
 - 3.3.4.1 A charging statement shall indicate the referenced code section(s) and whether the code change proposal is intended to be an addition, a deletion or a revision to existing Code text.
 - 3.3.4.2 Whenever practical, the existing wording of the text shall be preserved with only such deletions and additions as necessary to accomplish the desired change.
 - 3.3.4.3 Each code change proposal shall be in proper code format and terminology.
 - 3.3.4.4 Each code change proposal shall be complete and specific in the text to eliminate unnecessary confusion or misinterpretation.
 - 3.3.4.5 The proposed text shall be in mandatory terms.

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

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

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

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

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

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

3.3.5.6 Cost Impact: The proponent shall indicate one of the following regarding the cost impact of the code change proposal: 1) the code change proposal will increase the cost of construction; or 2) the code change proposal will not increase the cost of construction. The proponent should submit information to support either assertion. Any such information will be considered by the code development committee. This information will be included in the bibliography of the published code change proposal.

3.4 Online Submittal: Each code change proposal and all substantiating information shall be submitted online at the website designated by ICC. Two copies of each proposed new referenced standard in hard copy or one copy in electronic form shall be submitted. Additional copies may be requested when determined necessary by the Secretariat to allow such information to be distributed to the code development committee. Where such additional copies are requested, it

shall be the responsibility of the proponent to send such copies to the respective code development committee.

3.5 Submittal Deadline: ICC shall establish and post the submittal deadline for each cycle. The posting of the deadline shall occur no later than 120 days prior to the code change deadline. Each code change proposal shall be submitted online at the website designated by ICC by the posted deadline. The submitter of a code change proposal is responsible for the proper and timely receipt of all pertinent materials by the Secretariat.

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

3.6.1 Code References:

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

3.6.1.2 The need for the standard to be referenced shall be established.

3.6.2 Standard Content:

3.6.2.1 A standard or portions of a standard intended to be enforced shall be written in mandatory language.

3.6.2.2 The standard shall be appropriate for the subject covered.

3.6.2.3 All terms shall be defined when they deviate from an ordinarily accepted meaning or a dictionary definition.

3.6.2.4 The scope or application of a standard shall be clearly described.

3.6.2.5 The standard shall not have the effect of requiring proprietary materials.

3.6.2.6 The standard shall not prescribe a proprietary agency for quality control or testing.

3.6.2.7 The test standard shall describe, in detail, preparation of the test sample, sample selection or both.

3.6.2.8 The test standard shall prescribe the reporting format for the test results. The format shall identify the key performance criteria for the element(s) tested.

3.6.2.9 The measure of performance for which the test is conducted shall be clearly defined in either the test standard or in Code text.

3.6.2.10 The standard shall not state that its provisions shall govern whenever the referenced standard is in conflict with the requirements of the referencing Code.

3.6.2.11 The preface to the standard shall announce that the standard is promulgated according to a consensus procedure.

3.6.3 Standard Promulgation:

3.6.3.1 Code change proposals with corresponding changes to the code text which include a reference to a proposed new standard or a proposed update of an existing referenced standard shall comply with this section. The standard shall be completed and readily available prior to the Public Comment Hearing based on the cycle of code development which includes the code change proposal. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If a new standard is not submitted in at least draft form, the code change proposal shall be considered incomplete and shall not be processed. Updating of standards without corresponding code text changes shall be accomplished administratively in accordance with Section 4.6.

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

4.0 Processing of Code Change Proposals

4.1 Intent: The processing of code change proposals is intended to ensure that each proposal

complies with these Rules of Procedure and that the resulting published code change proposal accurately reflects that proponent's intent.

- 4.2 Review:** Upon receipt in the Secretariat's office, the code change proposals will be checked for compliance with these Rules of Procedure as to division, separation, number of copies, form, language, terminology, supporting statements and substantiating data. Where a code change proposal consists of multiple parts which fall under the maintenance responsibilities of different code committees, the Secretariat shall determine the code committee responsible for determining the committee action in accordance with Section 5.6 and the Code Scoping Coordination Matrix (see Section 1.3.1).
- 4.3 Incomplete Code Change Proposals:** When a code change proposal is submitted with incorrect format, without the required information or judged as not in compliance with these Rules of Procedure, the Secretariat shall notify the proponent of the specific deficiencies and the proposal shall be held until the deficiencies are corrected, with a final date set for receipt of a corrected submittal. If the Secretariat receives the corrected code change proposal after the final date, the proposal shall be held over until the next code development cycle. Where there are otherwise no deficiencies addressed by this section, a code change proposal that incorporates a new referenced standard shall be processed with an analysis of the referenced standard's compliance with the criteria set forth in Section 3.6.
- 4.4 Editorial Code Change Proposals.** When a code change proposal is submitted that proposes an editorial or format change that, in the opinion of the Secretariat, does not affect the scope or application of the code, the proposal shall be submitted to the Code Correlation Committee who shall deem the code change proposal as editorial or send the proposal back to the Secretariat to be considered by the appropriate code development committee. To be deemed editorial, such proposal shall require a majority vote of the Code Correlation Committee. Editorial proposals shall be published in the Code Change Agenda. Such proposals shall be added to the hearing agenda for consideration by the appropriate code development committee upon written request to ICC by any individual. The deadline to submit such requests shall be 14 days prior to the first day of the Committee Action Hearing. Code Correlation Committee proposals that are not added to a code development committee hearing agenda shall be published in the next edition of the code with no further consideration.
- 4.5 Copy Editing Code Text:** The Chief Executive Officer shall have the authority at all times to make editorial style and format changes to the Code text, or any approved changes, consistent with the intent, provisions and style of the Code. Such editorial style or format changes shall not affect the scope or application of the Code requirements.
- 4.6 Updating Standards Referenced in the Codes:** The updating of standards referenced by the Codes shall be accomplished administratively by the Administrative Code Development Committee in accordance with these full procedures except that the deadline for availability of the updated standard and receipt by the Secretariat shall be December 1 of the third year of each code cycle. The published version of the new edition of the Code which references the standard will refer to the updated edition of the standard. If the standard is not available by the deadline, the edition of the standard as referenced by the newly published Code shall revert back to the reference contained in the previous edition and an errata to the Code issued. Multiple standards to be updated may be included in a single proposal.
- 4.7 Preparation:** All code change proposals in compliance with these procedures shall be prepared in a standard manner by the Secretariat and be assigned separate, distinct and consecutive numbers. The Secretariat shall coordinate related proposals submitted in accordance with Section 3.3.2 to facilitate the hearing process.
- 4.8 Code Change Agenda:** All code change proposals shall be posted on the ICC website at least 30 days prior to the Committee Action Hearing on those proposals and shall constitute the agenda for the Committee Action Hearing. Any errata to the Code Change Agenda shall be posted on the ICC website as soon as possible. Code change proposals which have not been published in the original posting or subsequent errata shall not be considered.

5.0 Committee Action Hearing

- 5.1 Intent:** The intent of the Committee Action Hearing is to permit interested parties to present their views including the cost and benefits on the code change proposals on the published agenda. The code development committee will consider such comments as may be presented in the development of their action on the disposition of such code change proposals. At the conclusion of the code development committee deliberations, the committee action on each code change proposal shall be placed before the hearing assembly for consideration in accordance with Section 5.7.
- 5.2 Committee:** The Codes and Standards Council shall review all applications and make committee appointment recommendations to the ICC Board. The Code Development Committees shall be appointed by the ICC Board.
- 5.2.1 Chairman/Moderator:** The Chairman and Vice-Chairman shall be appointed by the Codes and Standards Council from the appointed members of the committee. The ICC President shall appoint one or more Moderators who shall act as presiding officer for the Committee Action_Hearing.
- 5.2.2 Conflict of Interest:** A committee member shall withdraw from and take no part in those matters with which the committee member has an undisclosed financial, business or property interest. The committee member shall not participate in any committee discussion or any committee vote on the matter in which they have an undisclosed interest. A committee member who is a proponent of a code change proposal shall not participate in any committee discussion on the matter or any committee vote. Such committee member shall be permitted to participate in the floor discussion in accordance with Section 5.5 by stepping down from the dais.
- 5.2.3 Representation of Interest:** Committee members shall not represent themselves as official or unofficial representatives of the ICC except at regularly convened meetings of the committee.
- 5.2.4 Committee Composition:** The committee may consist of representation from multiple interests. A minimum of thirty-three and one-third percent (33.3%) of the committee members shall be regulators.
- 5.3 Date and Location:** The date and location of the Committee Action Hearing shall be announced not less than 60 days prior to the date of the hearing.
- 5.4 General Procedures:** *The Robert's Rules of Order* shall be the formal procedure for the conduct of the Committee Action Hearing except as a specific provision of these Rules of Procedure may otherwise dictate. A quorum shall consist of a majority of the voting members of the committee.
- 5.4.1 Chair Voting:** The Chairman of the committee shall vote only when the vote cast will break a tie vote of the committee.
- 5.4.2 Open Hearing:** The Committee Action Hearing is an open hearing. Any interested person may attend and participate in the floor discussion and assembly consideration portions of the hearing. Only code development committee members may participate in the committee action portion of the hearings (see Section 5.6). Participants shall not advocate a position on specific code change proposals with committee members other than through the methods provided in this policy.
- 5.4.3 Presentation of Material at the Public Hearing:** Information to be provided at the hearing shall be limited to verbal presentations and modifications submitted in accordance with Section 5.5.2. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 3.3.5.3 and other material submitted in response to a code change proposal shall be located in a designated area in the hearing room and shall not be distributed to the code development

committee at the public hearing.

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

5.4.5 Reconsideration: There shall be no reconsideration of a code change proposal after it has been voted on by the committee in accordance with Section 5.6.

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

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

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

5.4.7 Points of Order: Any person participating in the public hearing may challenge a procedural ruling of the Moderator or the Chairman. A majority vote of ICC Members in attendance shall determine the decision.

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

5.5.1 Discussion Order:

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

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

5.5.2.1 Submission. All modifications shall be submitted electronically to the ICC Secretariat in a format determined by ICC unless determined by the Chairman to be either editorial or minor in nature. The modification will be forwarded electronically to the members of the code development committee during the hearing and will be projected on the screen in the hearing room.

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

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

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

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

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

1. Approve the code change proposal As Submitted (AS) or
2. Approve the code change proposal As Modified with specific modifications (AM), or
3. Disapprove the code change proposal (D)

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

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

The code development committee shall maintain a record of its proceedings including the action on each code change proposal.

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

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

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

5.7.2 Assembly Floor Motion Consideration: On receipt of a second to the floor motion, the Moderator shall accept the motion and the second and notify the attendees that the

motion will be considered in an online ballot following the hearing in accordance with Section 5.7.3. No additional testimony shall be permitted.

5.7.3 Online Assembly Floor Motion Ballot: Following the Committee Action Hearing, all assembly floor motions which received a second shall be compiled into an online ballot. The ballot will include:

1. The code change proposal as published.
2. The committee action and reason from the Committee Action Hearing.
3. The floor motion, including modifications which are part of the floor motion.
4. Access to the audio and video of the Committee Action Hearing proceedings.
5. Identification of the ballot period for which the online balloting will be open.

5.7.4 Eligible Online Assembly Motion Voters: All members of ICC shall be eligible to vote on online assembly floor motions. Each member is entitled to one vote, except that each Governmental Member Voting Representative may vote on behalf of its Governmental Member. Individuals who represent more than one Governmental Member shall be limited to a single vote. Application, whether new or updated, for ICC membership must be received by the Code Council 30 days prior to the first day of the Committee Action Hearing. The ballot period will not be extended beyond the published period except as approved by the ICC Board.

5.7.5 Assembly Action: A successful assembly action shall be a majority vote of the votes cast by eligible voters (see Section 5.7.4). A successful assembly action results in an automatic public comment to be considered at the Public Comment Hearing (see Section 7.4).

5.8 Report of the Committee Action Hearing: The results of the Committee Action Hearing, including committee action and reason, online assembly floor motion vote results and the total vote count for each assembly floor motion shall be posted on the ICC website not less than 60 days prior to the Public Comment Hearing, except as approved by the ICC Board.

6.0 Public Comments

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

1. Consideration of items for which a public comment has been submitted; and
2. Consideration of items which received a successful assembly action.

6.2 Deadline: The deadline for receipt of a public comment to the results of the Committee Action Hearing shall be announced at the Committee Action Hearing but shall not be less than 30 days subsequent to the availability of the Report of the Committee Action Hearing (see Section 5.8).

6.3 Withdrawal of Public Comment: A public comment may be withdrawn by the public commenter at any time prior to public comment consideration of that comment. A withdrawn public comment shall not be subject to public comment consideration. If the only public comment to a code change proposal is withdrawn by the public commenter prior to the vote on the consent agenda in accordance with Section 7.5.4, the proposal shall be considered as part of the consent agenda. If the only public comment to a code change proposal is withdrawn by the public commenter after the vote on the consent agenda in accordance with Section 7.5.4, the proposal shall continue as part of the individual consideration agenda in accordance with Section 7.5.5, however the public comment shall not be subject to public comment consideration.

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

following information:

6.4.1 Public comment: Each public comment shall include the name, title, mailing address, telephone number and email address of the public commenter. Email addresses shall be published with the public comments unless the commenter otherwise requests on the submittal form.

If a group, organization, or committee submits a public comment, an individual with prime responsibility shall be indicated. If a public comment is submitted on behalf a client, group, organization or committee, the name and mailing address of the client, group, organization or committee shall be indicated. The scope of the public comment shall be consistent with the scope of the original code change proposal, committee action or successful assembly action. Public comments which are determined as not within the scope of the code change proposal, committee action or successful assembly action shall be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. A copyright release in accordance with Section 3.3.5.5 shall be provided with the public comment.

6.4.2 Code Reference: Each public comment shall include the code change proposal number.

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

6.4.4 Desired Final Action: In order for a public comment to be considered, the public comment shall indicate the desired Final Action as one of the following:

1. Approve the code change proposal As Submitted (AS), or
2. Approve the code change proposal As Modified by the committee modification published in the Report of the Committee Action Hearing (AM) or published in a public comment in the Public Comment Agenda (AMPC), or
3. Disapprove the code change proposal (D)

6.4.5 Supporting Information: The public comment shall include a statement containing a reason and justification for the desired Final Action on the code change proposal. Reasons and justification which are reviewed in accordance with Section 6.5 and determined as not germane to the technical issues addressed in the code change proposal or committee action may be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. The public commenter shall have the right to appeal this action in accordance with the policy of the ICC Board. A bibliography of any substantiating material submitted with a public comment shall be published with the public comment and the substantiating material shall be made available at the Public Comment_Hearing. All substantiating material published by ICC is material that has been provided by the proponent and in so publishing ICC makes no representations or warranties about its quality or accuracy.

6.4.6 Online submittal: Each public comment and substantiating information shall be submitted online at the website designated by ICC. Additional copies may be requested when determined necessary by the Secretariat.

6.4.7 Submittal Deadline: ICC shall establish and post the submittal deadline for each cycle. The posting of the deadline shall occur no later than 120 days prior to the public comment deadline. Each public comment shall be submitted online at the website designated by ICC by the posted deadline. The submitter of a public comment is responsible for the proper and timely receipt of all pertinent materials by the Secretariat.

- 6.5 Review:** The Secretariat shall be responsible for reviewing all submitted public comments from an editorial and technical viewpoint similar to the review of code change proposals (see Section 4.2).
- 6.5.1 Incomplete Public Comment:** When a public comment is submitted with incorrect format, without the required information or judged as not in compliance with these Rules of Procedure, the public comment shall not be processed. The Secretariat shall notify the public commenter of the specific deficiencies and the public comment shall be held until the deficiencies are corrected, or the public comment shall be returned to the public commenter with instructions to correct the deficiencies with a final date set for receipt of the corrected public comment.
- 6.5.2 Duplications:** On receipt of duplicate or parallel public comments, the Secretariat may consolidate such public comments for public comment consideration. Each public commenter shall be notified of this action when it occurs.
- 6.5.3 Deadline:** Public comments received by the Secretariat after the deadline set for receipt shall not be published and shall not be considered as part of the public comment consideration. This deadline shall not apply to public comments submitted by the Code Correlation Committee. In order to correlate submitted public comments with action taken at the Committee Action Hearing on code change proposals that did receive a public comment, the Code Correlation Committee, in conjunction with staff processing of public comments, shall review the submitted public comments and submit the necessary public comments in order to facilitate the coordination of code change proposals. Such review and submittal shall not delay the posting of the Public Comment Agenda as required in Section 6.6.
- 6.6 Public Comment Agenda:** The Committee Action Hearing results on code change proposals that have not received a public comment and code change proposals which received public comments or successful assembly actions shall constitute the Public Comment Agenda. The Public Comment Agenda shall be posted on the ICC website at least 30 days prior the Public Comment Hearing. Any errata to the Public Comment Agenda shall be posted on the ICC website as soon as possible. Code change proposals and public comments which have not been published in the original posting or subsequent errata shall not be considered.

7.0 Public Comment Hearing

- 7.1 Intent:** The Public Comment Hearing is the first of two steps to make a final determination on all code change proposals which have been considered in a code development cycle by a vote cast by eligible voters (see Section 9.0). The second step, which follows the Public Comment Hearing, is the Online Governmental Consensus Vote that is conducted in accordance with Section 8.0.
- 7.2 Date and Location:** The date and location of the Public Comment Hearing shall be announced not less than 60 days prior to the date of the hearing.
- 7.3 Moderator:** The ICC President shall appoint one or more Moderators who shall act as presiding officer for the Public Comment Hearing.
- 7.4 Public Comment Agenda:** The Public Comment Consent Agenda shall be comprised of code change proposals which have neither a successful assembly action nor public comment. The agenda for public testimony and individual consideration shall be comprised of proposals which have a successful assembly action or public comment (see Section 6.1).
- 7.5 Procedure:** *The Robert's Rules of Order* shall be the formal procedure for the conduct of the Public Comment Hearing except as these Rules of Procedure may otherwise dictate.
- 7.5.1 Open Hearing:** The Public Comment Hearing is an open hearing. Any interested person may attend and participate in the floor discussion.
- 7.5.2 Agenda Order:** The Secretariat shall publish a Public Comment Agenda for the Public Comment Hearing, placing individual code change proposals and public comments in a

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

- 7.5.3 Presentation of Material at the Public Comment Hearing:** Information to be provided at the hearing shall be limited to verbal presentations. Each individual presenting information at the hearing shall state their name and affiliation, and shall identify any entities or individuals they are representing in connection with their testimony. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 6.4.5 and other material submitted in response to a code change proposal or public comment shall be located in a designated area in the hearing room.
- 7.5.4 Public Comment Consent Agenda:** The Public Comment Consent Agenda (see Section 7.4) shall be placed before the assembly with a single motion for Final Action in accordance with the results of the Committee Action Hearing. When the motion has been seconded, the vote shall be taken with no testimony being allowed. A simple majority (50% plus one) based on the number of votes cast by eligible voters shall decide the motion. This action shall not be subject to the Online Governmental Consensus Vote following the Public Comment Hearing (see Section 8.0).
- 7.5.5 Public Comment Individual Consideration Agenda:** Upon completion of the Public Comment Consent Agenda vote, all code change proposals not on the Public Comment Consent Agenda shall be placed before the assembly for individual consideration of each item (see Section 7.4).
- 7.5.6 Reconsideration:** There shall be no reconsideration of a code change proposal after it has been voted on in accordance with Section 7.5.8.
- 7.5.7 Time Limits:** Time limits shall be established as part of the agenda for testimony on all code change proposals at the beginning of each hearing session. Each person requesting to testify on a code change proposal shall be given equal time. In the interest of time and fairness to all hearing participants, the Moderator shall have limited authority to modify time limitations on debate. The Moderator shall have the authority to adjust time limits as necessary in order to complete the hearing agenda.
- 7.5.7.1 Time Keeping:** Keeping of time for testimony by an individual shall be by an automatic timing device. Remaining time shall be evident to the person testifying. Interruptions during testimony shall not be tolerated. The Moderator shall maintain appropriate decorum during all testimony.
- 7.5.8 Discussion and Voting:** Discussion and voting on code change proposals being individually considered shall be in accordance with the following procedures and the voting majorities in Section 7.6:
- 7.5.8.1 Proponent testimony:** The Proponent of a public comment is permitted to waive an initial statement. The Proponent of the public comment shall be permitted to have the amount of time that would have been allocated during the initial testimony period plus the amount of time that would be allocated for rebuttal. Where a public comment is submitted by multiple proponents, this provision shall permit only one proponent of the joint submittal to waive an initial statement.
- 7.5.8.2 Points of Order:** Any person participating in the public hearing may challenge a procedural ruling of the Moderator. A majority vote of ICC Members in attendance shall determine the decision.
- 7.5.8.3 Eligible voters:** Voting shall be limited to eligible voters in accordance with Section 9.0.

- 7.5.8.4 Allowable Final Action Motions:** The only allowable motions for Final Action are Approval as Submitted (AS), Approval as Modified by the committee (AM) or by one or more modifications published in the Public Comment Agenda (AMPC), and Disapproval (D).
- 7.5.8.5 Initial Motion:** The code development committee action shall be the initial motion considered.
- 7.5.8.6 Motions for Modifications:** Whenever a motion under consideration is for Approval as Submitted or Approval as Modified, a subsequent motion and second for a modification published in the Public Comment Agenda may be made (see Section 6.4.4). Each subsequent motion for modification, if any, shall be individually discussed and voted before returning to the main motion. A two-thirds majority based on the number of votes cast by eligible voters shall be required for a successful motion on all modifications.
- 7.5.8.7 Voting:** After dispensing with all motions for modifications, if any, and upon completion of discussion on the main motion, the Moderator shall then ask for the vote on the main motion. The vote on the main motion shall be taken electronically with the vote recorded and each vote assigned to the eligible voting member. If the motion fails to receive the majority required in Section 7.6, the Moderator shall ask for a new motion.
- 7.5.8.8 Subsequent Motion:** If the initial motion is unsuccessful, a motion for either Approval as Submitted or Approval as Modified by one or more published modifications is in order. A motion for Disapproval is not in order. The vote on the main motion shall be taken electronically with the vote recorded and each vote assigned to the eligible voting member. If a successful vote is not achieved, Section 7.5.8.9 shall apply.
- 7.5.8.9 Failure to Achieve Majority Vote at the Public Comment Hearing.** In the event that a code change proposal does not receive any of the required majorities in Section 7.6, the results of the Public Comment Hearing for the code change proposal in question shall be Disapproval. The vote count that will be reported as the Public Comment Hearing result will be the vote count on the main motion in accordance with Section 7.5.8.7.
- 7.5.8.10 Public Comment Hearing Results:** The result and vote count on each code change proposal considered at the Public Comment Hearing shall be announced at the hearing. The results shall be posted and included in the Online Governmental Consensus Ballot (see Section 8.2).

7.6 Majorities for Final Action: The required voting majority for code change proposals individually considered shall be based on the number of votes cast of eligible voters at the Public Comment Hearing shall be in accordance with the following table:

Committee Action	Desired Final Action		
	AS	AM/AMPC	D
AS	Simple Majority	2/3 Majority	Simple Majority
AM	2/3 Majority	Simple Majority to sustain the Committee Action or; 2/3 Majority on each additional modification and 2/3 Majority on entire code change proposal for AMPC	Simple Majority
D	2/3 Majority	2/3 Majority	Simple Majority

8.0 Online Governmental Consensus Vote

8.1 Public Comment Hearing Results: The results from the Individual Consideration Agenda at the

Public Comment Hearing (see Sections 7.5.5 and 7.5.8.10) shall be the basis for the Online Governmental Consensus Vote. The ballot shall include the voting options in accordance with the following table:

Committee Action	Public Comment Hearing result and Voting Majority	Online Governmental Consensus Ballot and Voting Majority	
AS	AS: Simple Majority	AS: Simple Majority	D: Simple Majority
	AMPC: 2/3 Majority	AMPC: 2/3 Majority	D: Simple Majority
	D: Simple Majority	AS: Simple Majority	D: Simple Majority
AM	AS: 2/3 Majority	AS: 2/3 Majority	D: Simple Majority
	AM: Simple Majority	AM: Simple Majority	D: Simple Majority
	AMPC: 2/3 Majority	AMPC: 2/3 Majority	D: Simple Majority
	D: Simple Majority	AM: Simple Majority	D: Simple Majority
D	AS: 2/3 Majority	AS: 2/3 Majority	D: Simple Majority
	AMPC: 2/3 Majority	AMPC: 2/3 Majority	D: Simple Majority
	D: Simple Majority	AS: 2/3 Majority	D: Simple Majority

8.2 Online Governmental Consensus Ballot: The ballot for each code change proposal considered at the Public Comment Hearing will include:

1. The Public Comment Hearing result and vote count.
2. The allowable Online Governmental Consensus Vote actions in accordance with Section 8.1.
3. Where the Public Comment Hearing result is As Submitted (AS) or Disapproval (D), the original code change proposal will be presented.
4. Where the Public Comment Hearing result is As Modified by the committee (AM) or As Modified by one or more Public Comments (AMPC), the original code change and approved modification(s) will be presented.
5. The committee action taken at the Committee Action Hearing.
6. ICC staff identification of correlation issues.
7. For those who voted at the Public Comment Hearing, the ballot will indicate how they voted.
8. An optional comment box to provide comments.
9. Access to the Public Comment Agenda which includes: the original code change, the report of the committee action and the submitted public comments.
10. Access to the audio and video of the Committee Action and Public Comment Hearing proceedings.
11. Identification of the ballot period for which the online balloting will be open.

8.3 Voting process: Voting shall be limited to eligible voters in accordance with Section 9.0. Eligible voters are authorized to vote during the Public Comment Hearing and during the Online Governmental Consensus Vote; however, only the last vote cast will be included in the final vote tabulation. The ballot period will not be extended beyond the published period except as approved by the ICC Board.

9.0 Eligible Final Action Voters

9.1 Eligible Final Action Voters: Eligible Final Action voters include ICC Governmental Member Voting Representatives and Honorary Members in good standing who have been confirmed by ICC in accordance with the Electronic Voter Validation System. Such confirmations are required to be revalidated annually. Eligible Final Action voters in attendance at the Public Comment Hearing and those participating in the Online Governmental Consensus Vote shall have one vote per eligible voter on all Codes. Individuals who represent more than one Governmental Member shall be limited to a single vote.

9.2 Applications: Applications for Governmental Membership must be received by the ICC at least 30 days prior to the Committee Action Hearing in order for its designated representatives to be eligible to vote at the Public Comment Hearing or Online Governmental Consensus Vote. Applications, whether new or updated, for Governmental Member Voting Representative status must be received by the Code Council 30 days prior to the commencement of the first day of the Public Comment Hearing in order for any designated representative to be eligible to vote. An

individual designated as a Governmental Member Voting Representative shall provide sufficient information to establish eligibility as defined in the ICC Bylaws. The Executive Committee of the ICC Board, in its discretion, shall have the authority to address questions related to eligibility.

10.0 Tabulation, certification and posting of results

- 10.1 Tabulation and Validation:** Following the closing of the online ballot period, the votes received will be combined with the vote tally at the Public Comment Hearing to determine the final vote on the code change proposal. ICC shall retain a record of the votes cast and the results shall be certified by a validation committee appointed by the ICC Board. The validation committee shall report the results to the ICC Board, either confirming a valid voting process and result or citing irregularities in accordance with Section 10.2.
- 10.2 Voting Irregularities:** Where voting irregularities or other concerns with the Online Governmental Consensus Voting process which are material to the outcome or the disposition of a code change proposal(s) are identified by the validation committee, such irregularities or concerns shall be immediately brought to the attention of the ICC Board. The ICC Board shall take whatever action necessary to ensure a fair and impartial Final Action vote on all code change proposals, including but not limited to:
1. Set aside the results of the Online Governmental Consensus Vote and have the vote taken again.
 2. Set aside the results of the Online Governmental Consensus Vote and declare the Final Action on all code change proposals to be in accordance with the results of the Public Comment Hearing.
 3. Other actions as determined by the ICC Board.
- 10.3 Failure to Achieve Majority Vote:** In the event a code change proposal does not receive any of the required majorities for Final Action in Section 8.0, Final Action on the code change proposal in question shall be Disapproval.
- 10.4 Final Action Results:** The Final Action on all code change proposals shall be published as soon as practicable after certification of the results. The results shall include the Final Action taken, including the vote tallies from both the Public Comment Hearing and Online Governmental Consensus Vote, as well the required majority in accordance with Section 8.0. ICC shall maintain a record of individual votes for auditing purposes, however, the record shall not be made public. The exact wording of any resulting text modifications shall be made available to any interested party.

11.0 Code Publication

- 11.1 Next Edition of the Codes:** The Final Action results on code change proposals shall be the basis for the subsequent edition of the respective Code.
- 11.2 Code Correlation:** The Code Correlation Committee is authorized to resolve technical or editorial inconsistencies resulting from actions taken during the code development process by making appropriate changes to the text of the affected code. Any such changes to a Code shall require a 2/3 vote of the Code Correlation Committee. Technical or editorial inconsistencies not resolved by the Code Correlation Committee shall be forwarded to the ICC Board for resolution.

12.0 Appeals

- 12.1 Right to Appeal:** Any person may appeal an action or inaction in accordance with Council Policy 1 Appeals. Any appeal made regarding voter eligibility, voter fraud, voter misrepresentation or breach of ethical conduct must be supported by credible evidence and must be material to the outcome of the final disposition of a code change proposal(s).

The following actions are not appealable:

1. Variations of the results of the Public Comment Hearing compared to the Final Action result in

- accordance with Section 10.4.
2. Denied requests to extend the voter balloting period in accordance with Sections 5.7.4 or 8.3.
 3. Lack of access to the internet based online collaboration and voting platform to submit a code change proposal, to submit a public comment or to vote.
 4. Code Correlation Committee changes made in accordance with Section 11.2.

13.0 Violations

- 13.1 ICC Board Action on Violations:** Violations of the policies and procedures contained in this Council Policy shall be brought to the immediate attention of the ICC Board for response and resolution. Additionally, the ICC Board may take any actions it deems necessary to maintain the integrity of the code development process.

2014 ICC CODE DEVELOPMENT CYCLE CROSS INDEX OF PROPOSED CODE CHANGES

Some of the code change proposals contain changes to sections of the IgCC that are outside the scope of committee responsible for the chapter of the IgCC in which the proposal is contained. The responsibilities of the IgCC Committees are as follows:

IgCC Energy/Water Committee: Chapters 6 and 7
IgCC General Committee: Chapters 1-5, 8-11

Listed in this cross index are proposed code changes that include sections of the code other than those listed for the respective committees above. For example, IgCC Section 302.1 is proposed for revision in code change GEW55-14, which is to be heard by the IgCC Energy/Water Committee. This section of the IgCC is typically the responsibility of the IgCC General Committee as listed above. It is therefore identified in this cross index. Another example is Section 601.4. Chapter 6 is normally maintained by the IgCC Energy/Water Committee, but Section 601.4 will be considered for revision in proposed code change GG74 which will be placed on the IgCC General Committee agenda.

This information is provided to assist users in locating all of the proposed code changes that would affect a certain section or chapter. For example, to find all of the proposed code changes that would affect Chapter 6, review the proposed code changes in the portion of the monograph for the IgCC Energy/Water Committee, then review this cross reference for Chapter 6 for proposed code changes published in the portion of the monograph for the IgCC General Committee.

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

PREFIX PROPOSED CHANGE GROUP (see monograph table of contents for location)

GEW International Green Construction Code – Energy/Water
GG International Green Construction Code – General

International Green Construction Code	
Section #	Code Change #
Chapter 2 202	
Bottle Filling Stations	GEW154
Daylight Response Control	GEW116
Daylight Zone	GEW116
Demand Response	GEW63
Demand Response Automation Software	GEW63
Demand Response Period	GEW54
Demand Response Signal	GEW54
Energy Storage System	GEW62
Grid-Interactive Electric Thermal Storage (GITS)	GEWE63
Onsite Renewable Energy System	GEW132, GEW133
Renewable Energy Credit(REC)	GEW133
Roof Recover	GEW77
Roof Repair	GEW77

Chapter 3	
302.1	GEW1, GEW3, GEW4, GEW26, GEW27, GEW55,
Chapter 6	
601.3	GG74, GG76 (on GEW Hearing Order)
601.4	GG74
602.1	GG76 (on GEW Hearing Order)
602.1.2.2	GG76 (on GEW Hearing Order)
602.1.2.3	GG76 (on GEW Hearing Order)
602.2	GG76 (on GEW Hearing Order)
602.2.2	GG76 (on GEW Hearing Order)
602.2.3	GG76 (on GEW Hearing Order)
605.1.1	GG76 (on GEW Hearing Order), GG78 (on GEW Hearing Order)
603.1	GG74
604.1	GG74
604.4	GG47 (on GEW hearing order)
608.1.3	GG47 (on GEW hearing order)
608.5	GG47 (on GEW hearing order)
611.3.5	GG47 (on GEW hearing order)
611.3.3.2	GG47 (on GEW hearing order)
Chapter 7	
701.1	GG74
702.7	GG74
Chapter 8	
808.8.2	GEW160
Chapter 9	
903.1	GEW3, GEW4, GEW122, GEW124, GEW188
Chapter 10	
1003.2.2	GEW3
1003.2.3	GEW3
1007.3	GEW1, GEW2, GEW3, GEW26, GEW27
Appendix A	GEW1
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A106.3.2	GEW98
A107.3.1	GEW188
A107.4.3	GEW188
A107.6.2	GEW188
A107.7.1	GEW188
A107.8	GEW188
A107.9	GEW188

2014 GROUP C COMMITTEE ACTION HEARING SCHEDULE

April 27 – May 3, 2014

Memphis Cook Convention Center, Memphis, TN

Hearings will start at 1:00 pm on Sunday, April 27th. Prior to the hearings the Building Official, Fire Service, PMG Official and Sustainability Membership Councils will be holding meetings during the Saturday/Sunday morning time period. Be sure to consult the [Membership Councils](#) webpage for details as they become available.

The code change volume is such that a single track will be utilized. The IgCC – General hearing will start at 1:00 pm on Sunday, April 27th. The IgCC – Energy/Water hearing will start no earlier than 1:00 pm on Wednesday, April 30th, as indicated on the schedule. The schedule anticipates that the hearings will finish by 2:00 pm on Saturday, May 3rd.

Sunday April 27	Monday April 28	Tuesday April 29	Wednesday April 30	Thursday May 1	Friday May 2	Saturday May 3
Start 1 pm	Start 8 am	Start 8 am	Start 8 am	Start 8 am	Start 8 am	Start 8 am
IgCC - General	IgCC - General	IgCC - General	IgCC – General IgCC – Energy/Water (Start no earlier than 1 pm)	IgCC – Energy/Water	IgCC – Energy/Water	IgCC – Energy/Water
End 7 pm	End 7 pm	End 7 pm	End 7 pm	End 7 pm	End 7 pm	Finish 2 pm

Notes:

1. IgCC General: Chapters 1, 3 – 5, 8 – Appendices. Be sure to consult the hearing order for code changes to be heard by the IgCC – Energy/Water code committee.
2. IgCC- Energy/Water: Chapters 6 & 7. Be sure to consult the hearing order for code changes to be heard by the IgCC – General code committee.
3. Consult the hearing order to determine which committee will consider code changes to the definitions in Chapter 2.
4. Hearing times may be modified at the discretion of the Chairman.
5. Breaks will be announced. A lunch break is planned. A dinner break is not planned. The hearings are scheduled to adjourn at the dinner break and resume the next day, unless necessary to complete the agenda.
6. Due to uncertainties in hearing progress, the start time indicated as “start no earlier than 1 pm” is conservatively estimated and is not intended to be scheduled hearing progress target.

**2014 PROPOSED CHANGES TO
THE INTERNATIONAL CODES**

<u>CODE</u>	<u>PAGE</u>
IgCC General	GG1
IgCC Energy/Water.....	GEW1

2014 PROPOSED CHANGES TO THE INTERNATIONAL GREEN CONSTRUCTION CODE (GENERAL)



INTERNATIONAL GREEN CONSTRUCTION CODE (GENERAL) COMMITTEE

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TENTATIVE ORDER OF DISCUSSION 2014 PROPOSED CHANGES TO THE INTERNATIONAL GREEN CONSTRUCTION CODE (GENERAL)

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

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation **does not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some GG code change proposals may not be included on this list, as they are being heard by the Energy/Water committee. Please consult the Cross Index of Proposed Changes. Note also that in this cycle, the hearing order places the code changes affecting hazardous materials first to give them proper attention.

GG3: Number Not Used

GG30: Number Not Used

GG99: Number Not Used

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GG1-14

101.5, 101.2

Proponent: Brenda Thompson, representing SEHPCAC

Delete without substitution:

~~**101.5 Intent.** This code is intended to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.~~

Revise as follows:

101.2 General Intent. The purpose of this code is to provide a reasonable level of safety for the environment and protection of public health, safety and welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction. This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

Reason: The topics of these code sections overlap. The last sentence of each is identical. The revised language is consistent with the similar text in other ICC codes and text approved by the membership in the public comment for ADM6-13.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG1-14 : 101.2-THOMPSON296

GG2-14

101.2

Proponent: David Collins, representing AIA (dcollins@preview-group.com)

Revise as follows:

101.2 General. ~~This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction.~~ This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

Reason: The designation as an “overlay” code is misleading as the IgCC regulates variables that are not regulated in other codes, and its goals are different than other codes. The first sentence of this code section can be deleted without confusing the intent of the section as the remaining language clearly describes the intent.

Cost Impact: Will not increase the cost of construction.

GG 2-14 : 101.2-COLLINS603

GG3-14

NUMBER NOT USED

GG4-14

101.2

Proponent: Jack Bailey, representing self (jbailey@oneluxstudio.com)

Revise as follows:

101.2 General. This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction. This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code. ~~This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.~~

Reason: "Intent" is found in Section 101.5 and does not belong in 101.2. The last sentence in this paragraph appears verbatim as the last sentence in 101.5 and does not need to be repeated here.

Cost Impact: Will not increase the cost of construction.

GG 4-14 : 101.2-BAILEY590

GG5-14

101.2

Proponent: Anthony Apfelbeck, representing City of Altamonte Springs
(ACApfelbeck@altamonte.org)

Revise as follows:

~~101.2~~102.1 General. This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction. This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

Reason: The current Section 101.2 General language addressing that the IgCC is an overlay Document intended to be used with the other codes and standards is really APPLICABILITY language that is more appropriate to Section 102. The proposal relocates that current language in section 101.2 to a new 102.1 and rennumbers the remaining sections in both Sections. This creates better readability and logical layout of the application language in code consistent with the layout of the section titles.

Cost Impact: Will not increase the cost of construction.

GG 5-14 : 101.2-APFELBECK248

GG6-14

101.2, 101.3, 102.4, 102.4.1 (New), 102.4.1

Proponent: Paul Coats, representing American Wood Council (pcoats@awc.org)

Delete without substitution:

~~**101.2 General.** This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction. This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.~~

Revise as follows:

~~**101.3-101.2 Scope.** The provisions of this code shall apply to buildings which undergo the design, construction, addition, alteration, change of occupancy, relocation, replacement, or repair, that is within the scope of the *International Building Code*; and the equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures within the scope of the *International Building Code*, and to the site on which the building is located. The following items shall apply to the use of this code and to any optional compliance path referenced in this code:~~

- ~~1. Occupancy classifications, height and area limitations, engineering properties of materials, and structural design shall be determined in accordance with the *International Building Code*[®] (IBC[®]).~~
- ~~2. Means of egress, fire protection systems and fire safety of the building and building site shall be in accordance with the *International Building Code*, *International Fire Code* and the *International Wildland Urban Interface Code*.~~
- ~~3. This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction.~~
- ~~4. This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code.~~
- ~~5. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.~~

Exceptions:

1. The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.
 - 1.1 Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.2 Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.3 Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.
2. The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing.
3. The code shall not apply to temporary structures *approved* under Section 3103 of the *International Building Code*.

4. Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3.

102.4 Referenced codes and standards. ~~The following codes shall be considered part of the requirements of this code: the *International Building Code*, the *International Code Council Performance Code*[®] (ICCPC[®]), the *International Energy Conservation Code*[®] (IECC[®]), the *International Existing Building Code*[®] (IEBC[®]), the *International Fire Code*[®] (IFC[®]), the *International Fuel Gas Code*[®] (IFGC[®]), the *International Mechanical Code*[®] (IMC[®]), the *International Plumbing Code*[®] (IPC[®]), *International Property Maintenance Code*[®] (IPMC[®]), and the *International Residential Code*[®] (IRC[®]).~~ The codes and standards referenced in this code shall be those that are listed in Chapter 12, and such codes and standards shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Section 102.4.1 and 102.4.2.

Add new text as follows:

102.4.1 Conflicts. Where conflicts occur between provisions of this code and referenced standards, the provisions of this code shall apply.

Revise as follows:

102.4.1-102.4.2 Conflicting provisions Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code ~~or the International Codes listed in Section 102.4~~, the provisions of this code ~~or the International Codes listed in Section 102.4~~, as applicable, shall take precedence over the provisions in the referenced code or standard.

Reason: The main purpose of the proposed change is to make it clear that provisions of the IgCC cannot "override" provisions of the IBC, IFC, and other codes for areas that are within the scope of those codes. Also, current 102.4 makes all the I-codes "part of" the IgCC. This "adoption by reference" is inappropriate for an over-lay code--the IgCC will become of part of those codes which are duly adopted, not the other way around. Section 102.4.1 is modified to refer to conflicts with standards only, since as an overlay code the IgCC cannot conflict with the base codes, but only enhance them. The proposed language in 102.4 and the revisions to 102.4.1 are consistent with language in the IPMC, IPSDC, IMC, IFGC, IEBC, IPC, IRC and IWUIC.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG6-14 : 101.2-COATS729

GG7-14

101.3, 101.3.1

Proponent: Hope Medina, representing Cherry Hills Village (hmedina@coloradocode.net)

Revise as follows:

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located. Occupancy classifications shall be determined in accordance with the *International Building Code*[®] (IBC[®]).

Exceptions:

1. The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.
 - 1.1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.2. Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.3. Group R-2 and R-4 residential buildings ~~four~~three stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.
2. The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing.
3. The code shall not apply to temporary structures *approved* under Section 3103 of the *International Building Code*.
4. Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3.

101.3.1 Residential construction. In lieu of the requirements of this code the following shall be deemed-to-comply with this code:

1. Group R-2 and R-4 residential buildings ~~five~~four stories or more in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located that comply with ICC 700, with a minimum energy efficiency category requirements of the Silver performance level or equivalent.
2. Group R-2 and R-4 portions of mixed use buildings that comply with ICC 700, with minimum energy efficiency category requirements of the Silver performance level or equivalent. The remainder of the building and the site upon which the building is located shall comply with the provisions of this code.

Reason: The IgCC was created as an overlay code for the sustainable construction of commercial buildings. For the IgCC to truly be an overlay code it must be consistent with how commercial buildings are defined in the International Energy Conservation Code. Group R-2, R-3, and R-4 buildings more than three stories in height above grade plane are considered to be commercial buildings per the IECC. For these occupancies to be compatible with both the IgCC and the IECC the scope will need to be changed.

Bibliography:

International Energy Conservation Code - Chapter 2 Definitions

Cost Impact: Will increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the *International Green Construction Code*. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG7-14 : 101.3-MEDINA1002

GG8-14

101.3

Proponent: David Collins, representing AIA (dcollins@preview-group.com)

Revise as follows:

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located. Occupancy classifications shall be determined in accordance with the International *Building Code*® (IBC®).

Exceptions:

1. The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.
 - 1.1 Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.2 Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.3 Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.
2. The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing purposes.
3. The code shall not apply to temporary structures *approved* under Section 3103 of the *International Building Code*.
4. Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3.

Reason: The current language is not grammatically correct.

Cost Impact: Will not increase the cost of construction.

GG 8-14 : 101.3 #1-COLLINS604

GG9-14

101.3, 301.1.1, 302.1, Table 302.1

Proponent: Maureen Guttman, Building Codes Assistance Project, representing Building Codes Assistance Project (mguttman@ase.org)

Revise as follows:

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located. Occupancy classifications shall be determined in accordance with the *International Building Code*® (IBC®).

Exceptions:

1. The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.
 - 1.1 Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.2 Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.3 Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.
2. The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing.
3. The code shall not apply to temporary structures *approved* under Section 3103 of the *International Building Code*.
4. Where ASHRAE 189.1 is selected in accordance with Section ~~301.1.1~~302.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3.

301.1.1 Application. The requirements contained in this code are applicable to buildings, or portions of buildings. ~~As indicated in Section 101.3, these buildings shall meet either the requirements of ASHRAE 189.1 or the requirements contained in this code.~~

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. The jurisdiction shall indicate whether requirements for buildings, as indicated in Exception 4 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ASHRAE 189.1 shall apply and the remainder of this code shall not apply.
- ~~2.3.~~ Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
- ~~3.4.~~ Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 1. SCOPE			
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 4	<u>Other than buildings identified in Section 101.3, Exceptions 1 through 3, buildings shall comply with ASHRAE 189.1.</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged)

Reason: This proposal changes the use of ASHRAE 189.1 as an alternate to the IgCC from an option selected by the project designer/owner to a jurisdictional requirement. The ability to promote adoption of this code lies in the ability to convince municipalities and code officials that the learning curve is minimal. But when the choice between the IgCC or ASHRAE 189.1 is left to the discretion of the project team, the code enforcement personnel are obligated to know both codes equally well. This proposal will increase the adoptability and usability of this code.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG 9-14: 101.3-GUTTMAN531

GG10-14

101.3, 301.1.1

Proponent: Kathleen Petrie, representing City of Seattle, Department of Planning and Development (kathleen.petrie@seattle.gov)

Revise as follows:

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located. Occupancy classifications shall be determined in accordance with the *International Building Code®* (IBC®).

Exceptions:

1. The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.
 - 1.1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.2. Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.3. Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.
2. The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing.
3. The code shall not apply to temporary structures *approved* under Section 3103 of the *International Building Code*.
4. ~~Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3. Projects complying with the requirements of ASHRAE 189.1 shall not be required to comply with the requirements of this code.~~

Delete without substitution:

~~**301.1.1 Application.** The requirements contained in this code are applicable to buildings, or portions of buildings. As indicated in Section 101.3, these buildings shall meet either the requirements of ASHRAE 189.1 or the requirements contained in this code.~~

Reason: Sections 101.3 and 301.1.1 currently reference one another, creating an inaccurate loop. Each indicates that the other will provide clarification as to when ASHRAE 189.1 is allowed to be used. There were several public comments on how to allow the use of ASHRAE 189.1 in the 2012 IGCC code cycle which became difficult to track and probably difficult to edit. As revised, the code now clearly states that 189.1 is an alternate design option to the IGCC.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG10-14 : 101.3-PETRIE983

GG11-14

101.3, Chapter 12

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located. Occupancy classifications shall be determined in accordance with the *International Building Code*® (IBC®).

Exceptions:

1. The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.
 - 1.1 Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.2 Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.3 Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.
2. The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing.
3. The code shall not apply to temporary structures *approved* under Section 3103 of the *International Building Code*.
4. Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3.
5. This code shall not apply to Group I-2 facilities that comply with ASHRAE 189.3.

Add new standard as follows:

ASHRAE

189.3-2014 Design, Construction and Operation of Sustainable High-Performance Healthcare Facilities (formerly SPC 189.2)

Reason: ASHRAE 189.3 should be considered alternative means for Group I-2. ASHRAE 189.3 does address efficiency for all systems in a hospital. There needs to be an exception to accommodate financial hardships caused by the application of this code or the alteration of intrinsically historic and landmarked structures when the alterations will impact on the historic or landmark designation of the structure.

Healthcare facilities have a keen interest and, in many cases, the desire to develop in a sustainable manner. These facilities are often the largest and most energy intensive buildings in a community, and their leadership recognizes that saving energy and operating costs are an opportunity to reflect smart decision-making, care and stewardship of the environment and fiscal practicality. In a competitive and regulated market, there are however, limitations in the ability of healthcare facilities to provide the necessary capital for the increasing complex new facilities needed to meet sustainability objectives, especially as they presently experience eroding financial compensation for life-sustaining services. Likewise, the special requirements of the facility's use often dictate needs that are divergent from other facility types, and functions that may compel energy consumption for the sake of patient and worker safety. With the development of ASHRAE 189.3, Standard for the Design, Construction and Operation of Sustainable High-Performance Health Care Facilities, ASHRAE has sought to address not only the sustainability of healthcare facilities but also the specific ventilation requirements of a healthcare facility but also the separately from the general ventilation requirements as outlined in ASHRAE/ASHE Standard 170.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement

representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

A review of the standard proposed for inclusion in the code, ASHRAE 189.3 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG11-14 : 101.3-PAARLBERG422

GG12-14

101.3

Proponent: David Collins, Preview Group, representing AIA (dcollins@preview-group.com)

Revise as follows:

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located. Occupancy classifications shall be determined in accordance with the *International Building Code®* (IBC®).

Exceptions:

1. The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.
 - 1.1 Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.2 Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.
 - 1.3 Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.
2. The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing.
3. The code shall not apply to temporary structures *approved* under Section 3103 of the *International Building Code*.
4. Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3.
5. Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, applying the performance option within ASHRAE 189.1 shall show a zEPI of 50 or less.

Reason: To assure that ASHRAE 189.1 provides limitations to energy consumption that equates to the IgCC; this change adds a limitation to meet a zEPI of 50 as is proposed for this code.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 Of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG12-14 : 101.3 #2-COLLINS922

GG 13-14

101.3, 101.3.1, 101.3.2 (New), 302.1, Table 302.1

Proponent: Craig Conner, Self, representing self (craig.conner@mac.com)

Revise as follows:

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of buildings and structures or any appurtenances connected or attached to such buildings and structures. Occupancy classifications shall be determined in accordance with the International *Building Code*® (IBC®).

Exceptions:

1. ~~The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.~~
 - 1.1. ~~Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.~~
 - 1.2. ~~Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.~~
 - 1.3. ~~Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.~~
 2. ~~The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing.~~
 3. ~~The code shall not apply to temporary structures approved under Section 3103 of the International Building Code.~~
 4. ~~Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3.~~
1. Construction that complies with ASHRAE 189.1.
 2. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.
 2. Equipment or systems that are used primarily for industrial or manufacturing purposes.
 3. Temporary structures approved under Section 3103 of the International Building Code® (IBC®).

101.3.1 Residential construction. In lieu of the requirements of this code ~~the following shall be deemed to comply with this code:~~

1. ~~Group R-2, R-3 and R-4 residential buildings five four stories or more in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located that comply with ICC 700, with a minimum energy efficiency category requirements of the rating level of Silver performance level or equivalent. For~~
2. ~~Group R-2 and R-4 portions of mixed use buildings that comply with ICC 700, with a minimum energy efficiency category requirements of the rating level of Silver performance level or equivalent. ~~The remainder of the building and the building site upon which the building is located shall comply with the provisions of this code.~~~~

Add new text as follows:

101.3.2 Residential requirements. Where specifically adopted as requirements, detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane, including the building sites and accessory structures, shall comply with ICC 700.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. ~~The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.~~
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 1. SCOPE			
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

Reason: Spreading the residential option and ASHRAE option into multiple places in two chapters makes the code difficult to understand. This moves both to Chapter 1.

The ASHRAE 189.1 option is a fundamental choice in the IGCC. That option should be upfront and clear.

The residential exceptions are aligned with the residential / commercial split in the IECC based on the definition from the IECC. The I-codes need to be consistent.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG 13-14 : A101.3 (NEW)-CONNER1211

GG14-14

101.3.1

Proponent: David Collins, representing AIA (dcollins@preview-group.com)

Revise as follows:

101.3.1 Residential construction. ~~In lieu of the requirements of this code the~~ the following shall be deemed-to-comply with this code:

1. Group R-2 and R-4 residential buildings five stories or more in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located that comply with ICC 700, with a minimum energy efficiency category requirements of the Silver performance level or equivalent.
2. Group R-2 and R-4 portions of mixed use buildings that comply with ICC 700, with minimum energy efficiency category requirements of the Silver performance level or equivalent. The remainder of the building and the site upon which the building is located shall comply with the provisions of this code.

Reason: The phrase "in lieu of the requirements of this code" is misleading and unnecessary.

Cost Impact: Will not increase the cost of construction.

GG14-14 : 101.3.1-COLLINS605

GG15-14

101.3.1

Proponent: Mark Nowak, representing Steel Framing Alliance

Revise as follows:

101.3.1 Residential construction. In lieu of the requirements of this code the following shall be deemed-to-comply with this code:

1. Group R-1, R-2 and R-4 residential buildings, including associated incidental uses and accessory occupancies, five stories or more in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located that comply with ICC 700, with a minimum energy efficiency category requirements of the Silver performance level or equivalent.
2. Group R-1, R-2 and R-4 portions of mixed use buildings, including associated incidental uses and accessory occupancies that comply with ICC 700, with a minimum energy efficiency category requirement of the Silver performance level or equivalent. The remainder of the building and the site upon which the building is located shall comply with the provisions of this code.

Reason: This proposal expands the allowable list of residential buildings that can use ICC-700 to include R-1. There is no significant difference between R-1 and R-2 structures and both should be recognized in this section of the code.

The proposal also recognizes that most R1 and R2 buildings have some moderate amount of floor area dedicated to secondary uses such as boiler rooms, lobbies, and similar uses with a primary purpose of serving the main occupancy use. These buildings should be able to comply completely with the ICC 700 and not have to follow multiple codes for the incidental and accessory portions. The International Building Code acknowledges that secondary uses are necessary but limits their area to 10% of the total building area on a given story.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG15-14 : 101.3.1-NOWAK341

GG16-14

101.3.1

Proponent: Hope Medina, representing Cherry Hills Village (hmedina@coloradocode.net)

Delete without substitution:

~~**101.3.1 Residential construction.** In lieu of the requirements of this code the following shall be deemed to comply with this code:~~

- ~~1. Group R-2 and R-4 residential buildings five stories or more in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located that comply with ICC 700, with a minimum energy efficiency category requirements of the Silver performance level or equivalent.~~
- ~~2. Group R-2 and R-4 portions of mixed use buildings that comply with ICC 700, with a minimum energy efficiency category requirements of the Silver performance level or equivalent. The remainder of the building and the site upon which the building is located shall comply with the provisions of this code.~~

Reason: This code is an overlay code for sustainable construction of commercial buildings, so requirements for residential buildings should not be brought into the IgCC. The ICC 700, National Green Building Standard has provisions on how to regulate any residential portions of a mixed use building. The residential standard, National Green Building Standard ICC 700, states the provisions of this Standard shall apply to design and construction of the residential portion(s) of any building, not classified as an institutional use, in all climate zones. This Standard shall apply to subdivisions, building sites, building lots, accessory structures, and the residential portions of alterations, additions, renovations, mixed-use buildings, and historic buildings. The IgCC, which is an overlay code, and ICC 700 (NGBS), which is a standard, should not have intermingling requirements located in the IgCC.

Bibliography:

National Green Building Standard (ICC 700) - Scope

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG16-14 : 101.3.1-MEDINA1010

GG17-14

101.3.2 (New), 302.1, Table 302.1, 304.1 (New), Chapter 12

Proponent: Mike Collignon, representing Green Builder Coalition
(mcollignon@greenbuildercoalition.org)

Add new text as follows:

101.3.2 Low-rise Residential Construction. Where selected as a jurisdictional requirement in accordance with Section 302.1, the following buildings, including the building sites and accessory structures, shall comply with ICC 700 or Section 304.

1. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress.
2. Group R-3.
3. Group R-2 and R-4 residential buildings four stories or less in height above grade plane.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 with a performance level of silver or above or Section 304 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 1. SCOPE			
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700 <u>with a performance level of Silver or above or Section 304.</u>	<input type="checkbox"/> Yes	No <input type="checkbox"/>
101.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700 <u>with a performance level of Silver or above or Section 304.</u>	<input type="checkbox"/> Yes	No <input type="checkbox"/>
101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700 <u>with a performance level of Silver or above or Section 304.</u>	<input type="checkbox"/> Yes	No <input type="checkbox"/>

(Portions of table not shown remain unchanged.)

Add new text as follows:

304.1 Low Rise Residential Construction. Where projects that include residential buildings not more than 3 stories in height above grade plane are intended to be regulated by this section in accordance with Table 302.1, such projects shall comply with the following:

1. Not less than 30 percent of roof run-off shall be collected and diverted to landscape areas utilizing gutters, downspouts, scuppers, grading, swales, micro-basins or rainwater collection and storage system.
2. Not less than 75 percent of existing on-site native plants shall be salvaged.
3. Improved landscaping shall be native or Xeriscape.
4. Automatic irrigation system controllers shall include weather- or soil moisture-based controllers that automatically adjust irrigation rates in response to changes in weather conditions.
5. Termite control consisting of non-toxic materials such as borate treatment, physical barriers and pest-resistant building materials shall be provided.
6. A construction waste management plan in accordance with Section 503.1 shall be provided.
7. Wood used to construct the building or other elements on the building site shall not be tropical wood.
8. Dwellings shall comply with the International Energy Conservation Code.
9. Exterior lighting shall be provided with daylight sensors with a manual override switch to turn the exterior lighting off.
10. Building service water heater systems shall comply with Section 607.
11. Hot water lines, such as, but not limited to, trunk lines, branch lines, joints, elbows, and lines installed under floor slabs and within conditioned spaces, throughout the building shall have an insulation value of not less than R-3

Exception: Branch lines of a central manifold or parallel-connected distribution system are not required to be insulated.

12. Toilets shall have a flush rate of not more than 1.28 gallons.
13. Lavatory faucets shall have a flow rate of not more than 1.5 gpm.
14. Shower heads shall have a flow rate of not more than 2.0 gpm.
15. Air handling equipment or ductwork shall not be located inside a garage unless it is located in an isolated or air sealed mechanical room or space.
16. Duct openings shall be protected during construction in accordance with Section 803.1.1 or the ducts, coils and blower fan shall be cleaned before occupancy.
17. Emissions from composite wood products, adhesives and sealants, architectural paints and coatings, flooring and insulation shall be limited in accordance with Section 806.
18. Central vacuum systems shall be provided with outside exhaust.
19. Mechanical kitchen and bathroom exhaust fans shall vent to the outdoors and be installed in accordance with ASHRAE 62.2.
20. Combustion appliances shall be vented.
21. Space and water heating equipment shall be closed combustion or power-vented or located in a detached building or open-air facility.
22. The use of HCFC-free foam insulation shall not be prohibited.
23. Buildings in radon zone 1 shall comply with the radon-resistant construction requirements of Appendix F of the International Residential Code.
24. Buildings in radon zone 2 shall be tested and where results are determined to exceed safe radon limits, the building shall comply with the radon-resistant construction requirements of Appendix F of the International Residential Code.

Add new standard as follows:

ASHRAE

62.2-2013 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

Reason: There needs to be a "floor" for sustainable low-rise residential construction. Gone are the days where we can stand by or look the other way when it comes to irresponsible building practices. We know better.

ICC-700 is a residential standard, not a code. As of December 2013, the IgCC has been adopted in more than twice as many jurisdictions as ICC-700. Adding this set of provisions as a jurisdictional option will help ensure more communities can easily incorporate a residential component of the IgCC.

It is important to note this proposal does not eliminate ICC-700 (Silver performance level or above) as a compliance path for low-rise residential in the IgCC. But code officials should have a non-points based, non-partisan set of minimum requirements as a compliance option for sustainable low-rise residential construction within the IgCC.

Bibliography

2013 California Green Building Standard <https://law.resource.org/pub/us/code/bsc.ca.gov/qov.ca.bsc.2013.11.pdf>

2012 City of Dallas Green Construction Code http://www.dallascityhall.com/building_inspection/greenBuilding.html

Cost Impact: Will increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

A review of the standard proposed for inclusion in the code, ASHRAE 62.2 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG17-14 : 101.3.2 (NEW)-COLLIGNON824

GG18-14

101.5

Proponent: Carl Baldassarra, representing Rolf Jensen & Associates, Inc. (cbaldassarra@rjagroup.com)

Revise as follows:

101.5 Intent. The purpose of this ~~This code is intended~~ to establish the minimum requirements to safeguard provide a reasonable level of safety for the environment, and protection of public health, and general welfare, through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

Reason: This proposed revision is consistent with the changes made to many of the model codes in the Group B hearing process with approved Public Comments to ADM6-13. It is intended to better address the intent of the code by using the term "reasonable level of" safety, protection, etc., rather than the vague and apparently more absolute term "safeguard." The change at the beginning of the first sentence will make IgCC have terminology consistent with other I-Codes.

Cost Impact: Will not increase the cost of construction.

GG18-14: 101.5-BALDASSARRA483

GG19-14

101.5

Proponent: Marcelo Hirschler, representing North American Flame Resistant Alliance (gbhint@aol.com)

Revise as follows:

101.5 Intent. This code is intended to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. This code is not intended to abridge or supersede safety, including fire safety, health or environmental requirements under other applicable codes or ordinances.

Reason: It is essential that fire safety be one of the considerations to be included when considering the implications of an overlay code. It has been demonstrated repeatedly that increased fire safety will normally result in lower environmental emissions. In particular a series of fire-life cycle analyses (Fire-LCA) of various products (especially TV sets, electrical cables and upholstered furniture) it has been demonstrated that more fire safe products give environmental advantages. This fact should be recognized in the IgCC both as a general concept and in the intent.

Further explanation has been provided in the reason for the code change proposal to section 101.2 (General).

Cost Impact: Will not increase the cost of construction.

GG19-14: 101.5-HIRSCHLER943

GG20-14

101.5

Proponent: David Collins, representing AIA (dcollins@preview-group.com)

Revise as follows:

101.5 Intent. This code is intended to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. ~~This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.~~

Reason: The deleted language is redundant as it is identical to a statement in 101.2, General. Also, it is appropriate for an "Intent" section to state the intent of the code, but unnecessary to include a description of what the code is not intended for.

Cost Impact: Will not increase the cost of construction.

GG20-14: 101.5-COLLINS606

GG21-14

101.5

Proponent: Gregory Johnson, representing Outdoor Power Equipment Institute
(gjohnsonconsulting@gmail.com)

Revise as follows:

101.5 Intent. ~~This code is intended to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. The purpose of this code is to establish the minimum requirements to protect the public welfare and future availability of resources by regulating the construction, operations, and maintenance of buildings and building sites.~~ This code is not intended to abridge or ~~supersede~~ safety, health or environmental requirements under other applicable codes or ordinances.

Reason: The current intent section is cumbersome and needs clarity; the proposed section speaks directly to the intent and is informed by the classic definition of sustainable development, "*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*" It also states what should be automatic for every code – that it is a minimum standard.

The word "*supersede*" is stricken from the second sentence because as a layover code the IgCC does supersede some requirements of other codes such as the wall envelope provisions of the IECC in Section 605.

Cost Impact: Will not increase the cost of construction.

GG21-14 : 101.5-JOHNSON315

GG22-14

101.6 (New)

Proponent: Anthony Apfelbeck, City of Altamonte Springs, Florida, representing City of Altamonte Springs (ACApfelbeck@altamonte.org)

Add new text as follows:

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

Reason: This language is identical to the current language the IPC, IPSCD, IPMC, ISPSC, IFC, IFGC and IMC. Per the IPC Commentary "This is essential to safeguard the application of the code text to situations in which a provision of the code is declared illegal or unconstitutional. This section preserves the legislative action that put the legal provisions in place." Inserting this language into the IgCC to create consistency and protection for the IGCC is appropriate just as it is appropriate for the other ICC documents where this language is currently contained.

Cost Impact: Will not increase the cost of construction.

GG22-14 : 101.6 (NEW) #2-APFELBECK259

GG23-14

101.6 through 101.6.8 (New)

Proponent: Anthony Apfelbeck, City of Altamonte Springs, Florida, representing City of Altamonte Springs (ACApfelbeck@altamonte.org)

Add new text as follows:

101.6 Referenced codes. The other codes listed in Sections 101.6.1 through 101.6.6 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

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

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

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

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

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

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

101.6.7 Existing buildings. The provisions of the *International Existing Building Code* shall apply to all matters governing the repair, alteration, change of occupancy, addition to and relocation of existing buildings.

101.6.8 Wildland-urban interface. The provisions of the *International Wildland-Urban Interface Code* shall apply to matters governing the design and construction of buildings within wildland-urban interface areas.

Reason: This proposal inserts the language from 101.4 and subsections in the IBC into a new 101.6 in the IgCC. This provides consistency in the layout of the administrative chapters across the ICC documents. Direct references in Section 101 are appropriate to guide the user as to application of the other ICC codes.

Cost Impact: Will not increase the cost of construction.

GG23-14 : 101.6 (NEW) #1-APFELBECK249

GG24-14

102.1

Proponent: Craig Conner, representing self (craig.conner@mac.com)

Revise as follows:

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

Reason: In the existing language “most practical” is not clear or enforceable. What does “practical” mean? If a requirement is not easy, can I just ignore it because it does not seem “practical” to me? What if I've never done it before? What if it will cause me to miss my schedule?

This matches the IBC, where “most restrictive” is same as IBC Section 102.1. Impractical items are to be dealt with on a case-by-case basis. IBC Section 104.10 states that “Wherever there are practical difficulties involved in carrying out the provisions of this code, the *building official* shall have the authority to grant modifications for individual cases ...”

Cost Impact: Will not increase the cost of construction.

GG24-14 : 102.1-CONNER539

GG25-14

102.1

Proponent: Marcelo Hirschler, representing North American Flame Resistant Alliance (gbhint@aol.com)

Revise as follows:

102.1 Code conflicts. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most practical requirement that does not abridge or supersede any safety, health or environmental requirements under the applicable International Codes listed in Section 102.4 to meet the intent of the code shall govern.

Reason: The proposed change to this section will clarify further that if there are code conflicts, all safety, health and environmental requirements of the applicable International Codes shall govern. The proposed change is intended to emphasize the intent that the IgCC is an overlay code and that all safety requirements from the other International Codes shall apply.

Cost Impact: Will not increase the cost of construction

GG25-14 : 102.1-HIRSCHLER945

GG26-14

102.4

Proponent: David Collins, representing AIA (dcollins@preview-group.com)

102.4 Referenced codes and standards. Where adopted by the jurisdiction, the ~~The~~ following codes shall be considered part of the requirements of this code: the *International Building Code*, the *International Code Council Performance Code*® (ICCPC®), the *International Energy Conservation Code*® (IECC®), the *International Existing Building Code*® (IEBC®), the *International Fire Code*® (IFC®), the *International Fuel Gas Code*® (IFGC®), the *International Mechanical Code*® (IMC®), the *International Plumbing Code*® (IPC®), *International Property Maintenance Code*® (IPMC®), and the *International Residential Code*® (IRC®).

Reason: The provisions of the other International Codes can only be enforced if adopted by the appropriate jurisdiction. Without this qualifying statement the language of this section is misleading and could result in regulatory confusion.

Cost Impact: Will not increase the cost of construction.

GG26-14: 102.4-COLLINS607

GG27-14

102.4

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Brickfield, Burchette, Ritts & Stone (gas@bbrslaw.com); Brian Dean (Brian.Dean@icfi.com); William Prindle (william.prindle@icfi.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello (misuriello@verizon.net)

Revise as follows:

102.4 Referenced codes and standards. The following codes shall be considered part of the requirements of this code: the *International Building Code® (IBC®)*, the *International Code Council Performance Code® (ICCPC®)*, the *International Energy Conservation Code® (IECC®)*, the *International Existing Building Code® (IEBC®)*, the *International Fire Code® (IFC®)*, the *International Fuel Gas Code® (IFGC®)*, the *International Mechanical Code® (IMC®)*, the *International Plumbing Code® (IPC®)*, the *International Property Maintenance Code® (IPMC®)*, and the *International Residential Code® (IRC®)*. Buildings within the scope of this code, regardless of the method of compliance, shall be required to demonstrate compliance with the applicable codes listed in this section.

Reason: This proposal clarifies that the IgCC is a complement to, and not a replacement for, the foundational building codes developed by the International Code Council (the proposal also makes two small editorial revisions to clean up the section). Section 101.2 of the 2012 IgCC refers to the code as “an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction.” Consistent with this overlay concept, this simple clarification to Section 102.4 improves the code in two distinct ways:

- It sends a clear signal to design professionals that green buildings must not only have sustainable and energy efficient qualities, but must also meet fundamental building code requirements that have been developed over many years. This will help promote safer and more durable construction and will reinforce the role of the code official in enforcing all of the building codes.
- It recognizes that the IgCC is not designed to be a standalone code, and that it should not be used as a loophole to avoid compliance with the building codes. The new language clarifies that no matter how projects demonstrate compliance with the IgCC, they must also demonstrate compliance with the requirements of the underlying building codes.

For jurisdictions that have been properly applying the IgCC as a component of the complete International Codes family, this proposal will not change anything. As the IgCC is adopted on a more widespread basis, it is crucial that all the International Codes are properly integrated and applied along with the IgCC.

Cost Impact: Will not increase the cost of construction.

GG27-14 : 102.4-STONE900

GG28-14

102.4, 102.4.1

Proponent: Anthony Apfelbeck, City of Altamonte Springs, Florida, representing City of Altamonte Springs (ACApfelbeck@altamonte.org)

Revise as follows:

102.4 Referenced codes and standards. ~~The following codes shall be considered part of the requirements of this code: the *International Building Code*, the *International Code Council Performance Code*® (ICCPC®), the *International Energy Conservation Code*® (IECC®), the *International Existing Building Code*® (IEBC®), the *International Fire Code*® (IFC®), the *International Fuel Gas Code*® (IFGC®), the *International Mechanical Code*® (IMC®), the *International Plumbing Code*® (IPC®), *International Property Maintenance Code*® (IPMC®), and the *International Residential Code*® (IRC®). The codes and standards referenced in this code shall be those that are listed in Chapter 12, and such codes and standards shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.4.1 and 102.4.2.~~

Add new text as follows:

102.4.1 Conflicts. Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

Revise as follows:

~~**102.4.1-102.4.2 Conflicting provisions**~~ **Provisions in referenced codes and standards.** Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code ~~or the International Codes listed in Section 102.4~~, the provisions of this code ~~or the International Codes listed in Section 102.4~~, as applicable, shall take precedence over the provisions in the referenced code or standard.

Reason: This section has been revised to be consistent with the following codes: IPMC Section 102.7, IPSDC Section 102.10, IMC Section 102.8, IFGC Section 102.8, IEBC Section 102.4, IPC Section 102.8, IRC R102.4, IWUIC Section 102.4.

Cost Impact: Will not increase the cost of construction

GG28-14: 102.4-APFELBECK253

GG29-14

102.4.1

Proponent: Marcelo Hirschler, representing North American Flame Resistant Alliance
(gbhint@aol.com)

Revise as follows:

102.4.1 Conflicting provisions. Where the extent of the reference to a referenced code or standard, ~~other than the International Codes listed in Section 102.4,~~ includes subject matter that is within the scope of this code or the International Codes listed in Section 102.4, ~~the provisions of this code or the International Codes listed in Section 102.4,~~ as applicable, shall take precedence over the provisions in the referenced code or standard.

Reason: This section is potentially confusing because a reader may get the impression from reading it that the IgCC requirements can supersede requirements of any other ICC code. The proposed changes clarify the language and the fact that the IgCC is an overlay code so that other International Codes (but not any other references codes or standards) shall take precedence.

Cost Impact: Will not increase the cost of construction.

GG29-14: 102.4.1-HIRSCHLER947

GG30-14

NUMBER NOT USED

GG31-14

102.7

Proponent: David Collins, representing AIA (dcollins@preview-group.com)

Delete without substitution:

~~**102.7 Mixed occupancy buildings.** In mixed occupancy buildings, each portion of a building shall comply with the specific requirements of this code applicable to each specific occupancy.~~

Reason: The intent of this section is unclear and the wording is misleading. There are no Use Group specific requirements in the IgCC. Where use groups are called out, there can be no doubt what the intent is that requirement applies to that use and all other uses.

Cost Impact: Will not increase the cost of construction

GG31-14 : 102.7-COLLINS608

GG32-14

105.3, 106.1, 405.1.1, 602.1.3, 807.5, 807.6, 1007.3.3.1, 1007.3.3.2, 1007.3.3.3, 1101.2, A102.2, D102.2, D105.1

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

Revise as follows:

105.3 Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, the *code official* shall have the authority to grant modifications for individual cases, upon application of the owner or the owner's representative authorized agent, provided the *code official* shall first find that special individual reason makes the strict letter of this code impractical and that the modification is in compliance with the intent and purpose of this code and that such modification does not lessen the minimum requirements of this code. The details of granting modifications shall be recorded and entered in the files of the department.

106.1 Required. Any owner or owner's authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any energy, electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required permit under the applicable code or regulation relevant to the intended work. Separate permits shall not be issued under this code. Exemptions from permit requirements shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other applicable laws, codes or ordinances of this jurisdiction.

405.1.1 Soil and water quality protection plan. A soil and water quality protection plan shall be submitted by the owner the owner's authorized agent and *approved* prior to construction. The protection plan shall address the following:

1. A soils map, site plan, or grading plan that indicates designated soil management areas for all site soils, including, but not limited to:
 - 1.1. Soils that will be retained in place and designated as vegetation and soil protection areas (VSPAs).
 - 1.2. Topsoils that will be stockpiled for future reuse and the locations for the stockpiles.
 - 1.3. Soils that will be disturbed during construction and plans to restore disturbed soils and underlying subsoils to soil reference conditions.
 - 1.4. Soils that will be restored and re-vegetated.
 - 1.5. Soils disturbed by previous development that will be restored in place and re-vegetated.
 - 1.6. Locations for all laydown and storage areas, parking areas, haul roads and construction vehicle access, temporary utilities and construction trailer locations.
 - 1.7. Treatment details for each zone of soil that will be restored, including the type, source and expected volume of materials, including compost amendments, mulch and topsoil.
 - 1.8. A narrative of the measures to be taken to ensure that areas not to be disturbed and areas of restored soils are protected from compaction by vehicle traffic or storage, erosion, and contamination until project completion.
2. A written erosion, sedimentation and pollutant control program for construction activities associated with the project. The program shall describe the best management practices (BMPs) to be employed including how the BMPs accomplish the following objectives:
 - 2.1. Prevent loss of soil during construction due to stormwater runoff or wind erosion, including the protection of topsoil by stockpiling for reuse.
 - 2.2. Prevent sedimentation of stormwater conveyances or *receiving waters* or other public infrastructure.

- 2.3. Prevent polluting the air with dust and particulate matter.
- 2.4. Prevent runoff and infiltration of other pollutants from construction site, including, but not limited to thermal pollution, concrete wash, fuels, solvents, and hazardous chemical runoff, pH and pavement sealants. Ensure proper disposal of pollutants.
- 2.5. Protect from construction activities the designated vegetation and soil protection areas, *flood hazard areas* and other areas of vegetation that will remain on site.
3. A written periodic maintenance protocol for landscaping and stormwater management systems, including, but not limited to:
 - 3.1. A schedule for periodic watering of new planting that reflects different water needs during the establishment phase of new plantings as well as after establishment. Where development of the building site changed the amount of water reaching the preserved natural resource areas, include appropriate measures for maintaining the natural areas.
 - 3.2. A schedule for the use of fertilizers appropriate to the plants species, local climate and the preestablishment and post-establishment needs of the installed landscaping. Nonorganic fertilizers shall be discontinued following plant establishment.
 - 3.3. A requirement for a visual inspection of the site after major precipitation events to evaluate systems performance and site impacts.
 - 3.4. A schedule of maintenance activities of the stormwater management system including, but not limited to, cleaning of gutters, downspouts, inlets and outlets, removal of sediments from pretreatment sedimentation pits and wet detention ponds, vacuum sweeping followed by high- pressure hosing at porous pavement and removal of litter and debris.
 - 3.5. A schedule of maintenance activities for landscaped areas including, but not limited to, the removal of dead or unhealthy vegetation; reseeding of turf areas; mowing of grass to a height which optimizes lawn health and retention of precipitation.

602.1.3 Registered design professional in responsible charge of building energy simulation. For purposes of this section, and where it is required that documents be prepared by a *registered design professional*, the *code official* is authorized to require the owner or the owner's authorized agent to engage and designate on the building permit application a *registered design professional* who shall act as the registered design professional in responsible charge of building energy simulation. Modelers engaged by the registered design professional in responsible charge of building energy simulation shall be certified by an *approved* accrediting entity. Where the circumstances require, the owner or the owner's authorized agent shall designate a substitute registered design professional in responsible charge of building energy simulation who shall perform the duties required of the original registered design professional in responsible charge of building energy simulation. The *code official* shall be notified in writing by the owner or the owner's authorized agent whenever the registered design professional in responsible charge of building energy simulation is changed or is unable to continue to perform the duties.

807.5 Special inspections for sound levels. An approved agency, funded by the building owner or the owner's authorized agent shall furnish report(s) of test findings indicating that the sound level results are in compliance with this section, applicable laws and ordinances, and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's authorized agent, design professional, and the code official for purposes of demonstrating compliance.

807.6 Special inspections for sound transmission. An approved agency, employed by the building owner or the owner's authorized agent, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's authorized agent, design professional, and the code official for purposes of demonstrating compliance.

Exception: Test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.

1007.3.3.1 Annual net energy use. The zEPI associated with the operation of the building and the buildings on the site, as determined in accordance with Section 602.1, shall be reported by the building owner or the owner's ~~registered~~ authorized agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its zEPI reported separately. Where there is energy uses associated with the building site other than the buildings on the site, the zEPI for the building site shall be reported separately.

Energy use for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.

1007.3.3.2 Peak monthly energy demand reporting. The peak demand of all energy forms serving each building and the building site shall be reported by the building owner or the owner's ~~registered~~ authorized agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its energy demand reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the energy demand for the building site shall be reported separately.

Monthly energy demand data for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.

1007.3.3.3 Annual CO₂e emissions reporting. The annual emissions associated with the operation of the building and its systems, as determined in accordance with Section 602.2, shall be reported by the building owner or the owner's ~~registered~~ authorized agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its annual emissions reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the annual CO₂e emissions for the building site shall be reported separately.

Emissions reported for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.

1101.2 Operation and maintenance. Building sites shall be operated and maintained in conformance to the code edition under which the site improvements were installed. The owner or the owner's ~~designated~~ authorized agent shall be responsible for the operation and maintenance of building sites. To determine compliance with this section, the *code official* shall have the authority to require a building site to be reinspected. The requirements of this chapter shall not provide the basis for removal or abrogation of protections or systems from existing building sites.

A102.2 Required number of and selection of project electives. The jurisdiction shall indicate the number of project electives required in the blank provided in the row that references Section A102.2 in Tables A104, A105, A106, A107 and A108. Each project constructed in the jurisdiction shall be required to comply with this number of project electives. A total of not less than this number of project electives shall be selected by the owner or owner's authorized agent from each table. Selected project electives shall be applied as mandatory requirements for the project. Selected project electives shall be communicated to the *code official* by means of checking the appropriate boxes in the tables and providing a copy of the tables, or by inclusion of a list of selected project electives, with the construction documents.

D102.2 Owner responsibility. Except as otherwise specified in this code, the *owner* or the *owner's* ~~designated~~ authorized agent shall be responsible for the maintenance of buildings, structures and building site. No *owner*, *owner's authorized agent*, *operator*, or occupant shall cause any service, facility, equipment or utility that is required under this code to be removed or shut off from or discontinued.

D105.1 Unlawful acts. It shall be unlawful for an owner or an owner's ~~designated~~ authorized agent to be in conflict with, or violation of, any of the provisions of this code.

Reason: The purpose for the proposal is to coordinate the IGCC with ADM22-13 which standardized the references to "agent" throughout the other International codes. The term used is as "authorized agent." ADM 22 also added agents in some sections where it was warranted. ADM22-13 consisted of 5 parts; all were approved as submitted in Group B. This proposal makes similar changes in the IGCC.

Changes are not proposed for all instances where "applicant" and "owner" appear. In general, we propose changes where similar changes were made in ADM22-13, and where the term "agent" is already used.

We tried to minimize the number of technical changes in this proposal. The main purpose of the proposal is to standardize the terms used to refer to agents—not to give more authority to agents.

For example, we are not proposing to add agents to provisions requiring that owners be provided with documentation of building operations or building performance—that information is appropriately provided to the owner of the building. We also do not propose adding agents to sections that specify to whom legal notices are delivered.

Cost Impact: Will not increase the cost of construction.

GG32-14: 105.3-TRAXLER465

GG33-14

105.4

Proponent: Larry Wainright, representing Structural Building Components Association
(lwainright@qualtim.com)

Revise as follows:

105.4 Innovative approaches and alternative materials, design, and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design, innovative approach, or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design, innovative approach or method of construction shall be reviewed and *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, design, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code. The details of granting the use of alternative materials, designs, innovative approach and methods of construction shall be recorded and entered in the files of the department. Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

Reason: This proposal contains the same language approved in ADM23-13. The intent of this proposal is to bring the same language into the corresponding section in the IgCC. The language added is similar to that included at IBC Section 105.3.1 when a permit application is rejected. This proposed change assumes that the non-approval of an alternative method is not the same as the non-approval of a permit, i.e., the permit application may have been approved but an alternative method might not be approved until a later date. However, the reasons for responding to the applicant in writing are the same, as noted in the Commentary to section 105.3.1: 'In order to ensure effective communication and due process of law, the reasons for denial of an application for a permit are required to be in writing.'

Cost Impact: Will not increase the cost of construction

GG33-14 : 105.4-WAINRIGHT727

GG34-14

105.6.1

Proponent: David Collins, representing AIA (dcollins@preview-group.com)

Revise as follows:

105.6.1 Specific approval. The *code official* or authority having jurisdiction shall be permitted to approve programs or compliance tools for a specified application, limited scope or specific locale where the applicant demonstrates that the alternative means of compliance meets the intent and is the equivalent in sustainability of the prescriptive requirement. For example, a specific approval shall be permitted to apply to a specific section or chapter of this code.

Reason: The standard for approval of an alternative means of design in any other code should be the same as this code.

Cost Impact: Will not increase the cost of construction.

GG34-14: 105.6.1-COLLINS609

GG35-14

106.1, 106.2 (New)

Proponent: Anthony Apfelbeck, representing City of Altamonte Springs (ACApfelbeck@altamonte.org)

Revise as follows:

106.1 Required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any energy, electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be performed, shall first make application to the *code official* and obtain the required permit under the applicable code or regulation relevant to the intended work. Separate permits shall not be issued under this code.

106.2 Work exempt from permit. Exemptions from permit requirements shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other applicable laws, codes or ordinances of this jurisdiction.

Reason: This proposal reformats the last line of section 106.1 and moves it to a new 106.2. This is consistent with the format of the IBC section 105 and provides for better clarity/readability in the IgCC.

Cost Impact: Will not increase the cost of construction

GG35-14 : 106.1 -APFELBECK234

GG36-14

107.1

Proponent: Gregory Johnson, representing self (gjohnsonconsulting@gmail.com)

Delete without substitution:

~~**107.1 Fees.** Fees for permits shall be paid as required, in accordance with the schedule as established by the applicable governing authority for the intended work prescribed in an application.~~

Reason: Both Section 101.2, General, and Section 106, Permits, explicitly state that permits are not to be issued under the IGCC. This means that Section 107 is unneeded unless local government intends to charge fees for not issuing permits.

Cost Impact: Will not increase the cost of construction

GG36-14 : 107.1-JOHNSON1041

GG37-14

108.1

Proponent: David Collins, representing AIA (dcollins@preview-group.com)

Revise as follows:

108.1 General. Appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code shall be made to ~~the a~~ Board of Appeals ~~created under the applicable *International Code* as determined by the jurisdiction.~~

Reason: The authors of this code cannot second guess the method of enforcement and appeal as established by the local jurisdiction.

Cost Impact: Will not increase the cost of construction

GG37-14: 108.1-COLLINS610

GG38-14

108 (New), 108.1 (New)

Proponent: Anthony Apfelbeck, representing City of Altamonte Springs (ACApfelbeck@altamonte.org)

Add new text as follows:

SECTION 108 **INSPECTIONS**

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

Reason: The IgCC currently has a Section 106 PERMITS but does not contain an "INSPECTIONS" section. The section 106 PERMITS language in the IgCC is based on Section 105 of the IBC. Therefore, the proposed text for a new section 108 INSPECTIONS is based on the general SECTION 110 language from the IBC. Just as basic "PERMITS" language is necessary in the IgCC, a basic set of "INSPECTION" language is also necessary in the IgCC to ensure that inspections are carried out to ensure compliance with the IgCC.

Cost Impact: Will not increase the cost of construction.

GG38-14 : 110 (NEW)-APFELBECK233

GG39-14 202 (New)

Proponent: Hope Medina, representing Colorado Chapter of ICC (hmedina@coloradocode.net)

Add new definition as follows:

SECTION 202 DEFINITIONS

Acidification potential. The dissolved acid from fossil fuel combustion used in electricity production, heating and transportation and deposited by rain into ecosystems.

Eutrophication potential. The process by which a body of water acquires a high concentration of nutrients, especially phosphates and nitrates.

Ozone depletion potential. Destruction of the ozone gas in the upper atmospheric layer, caused by substances formed from breakdown of ozone depleting substances.

Smog potential. Emissions from industry and fossil-fueled transportation trapped at ground level reacting with sunlight producing photochemical smog.

Reason: The code asks for a reduction in global warming potential and lists these words without a definition of what they mean. The average end user is not going to know how to define these terms, and there is a difficulty in finding these definitions on the internet.

Cost Impact: Will not increase the cost of construction.

GG39-14 : 202-ACIDIFICATION POTENTIAL (NEW)-MEDINA1027

GG40-14 202

Proponent: Hope Medina, representing Colorado Chapter of ICC (hmedina@coloradocode.net)

Revise as follows:

SECTION 202 DEFINITIONS

ALTERATION. ~~Any construction or renovation to an existing structure other than repair or addition.~~ Any construction, retrofit or renovation to an existing structure other than repair or addition that requires a permit. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a permit.

Reason: The codes should have consistency with their definition for words throughout all of the I- code family. This is the approved definition that will be in the 2015 IECC, and for the IgCC to be consistent with the other I-codes this definition would need to be in place of what is currently in place for alteration. This concept is an especially important with how often the codes reference each other. The end user should be able to pick up any I code book, and not have any confusion on what the correct definition is.

Cost Impact: Will not increase the cost of construction.

GG40-14 : 202-ALTERATION-MEDINA1025

GG 41-14

202

Proponent: Maureen Traxler, representing WABO Technical Code Development Committee
(maureen.traxler@seattle.gov)

Revise as follows:

SECTION 202 DEFINITIONS

APPROVED. Acceptable to the *code official* ~~or authority having jurisdiction~~.

PERMIT. An official document or certificate issued by the code official that ~~jurisdiction which~~ authorizes performance of a specified activity.

Reason: This proposal correlates the IGCC with ADMSS-13. The same change proposed here was approved in ADMSS-13 for 7 of the International codes-Building, Fire, Mechanical, Plumbing, Fuel Gas, Property Maintenance, and Wildland Urban Interface codes.

The IGCC and all the International codes give the building official or code official sole authority to enforce the codes. Even though the IGCC in some instances designates an "authority having jurisdiction" the code official retains responsibility for approving permits and inspecting for compliance with the IGCC.

IGCC Section 103.1 states "The code official ... is hereby authorized and directed to enforce the provisions of this code."

Section 103.2 states "The code official shall enforce compliance with the provisions of this code as part of the enforcement of other applicable codes ..."

In Section 103.4, the code official is authorized to inspect for code compliance, accept reports of inspections by others, and to engage expert opinion.

There are some cases in the IGCC where it is appropriate to recognize another authority. In those cases, the code section specifically designates an authority having jurisdiction. The definition of "potable water" is an example-it references the "public health authority having jurisdiction" as the appropriate authority to determine water quality standards. Section 703.4 requires condensate to be discharged to the sanitary sewer unless prohibited by the authority having jurisdiction. Those are both areas that code officials typically don't regulate or have authority over.

Cost Impact: Will not increase the cost of construction.

GG 41-14: 202-APPROVED-TRAXLER470

GG42-14

202

Proponent: Lisa Reiheld, representing CSA Group (lisa.reiheld@csagroup.org)

Revise as follows:

SECTION 202 DEFINITIONS

APPROVED AGENCY. An established and recognized third-party testing agency regularly engaged in conducting tests or furnishing inspection services or commissioning services, where such agency has been approved.

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

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

Reason:

APPROVED AGENCY: Addition of "third-party testing" clarifies the type of organization that is being referred to.

LABELED: By replacing current content with "approved agency" the definition is simplified by using a previously defined term that is equivalent to terminology being removed.

LISTED: By replacing current content with "approved agency" the definition is simplified by using a previously defined term that is equivalent to terminology being removed.

Cost Impact: Will not increase the cost of construction

GG42-14 : 202-APPROVED AGENCY-REIHELD1190

GG 43-14

202

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

SECTION 202 DEFINITIONS

Add new definition as follows:

ASBESTOS-CONTAINING MATERIALS. Building materials containing one or more of the following mineral fibers in any detectable amounts greater than one percent that have been intentionally added or are present as a contaminant: chrysotile, amosite, crocidolite, tremolite, actinolite, anthophyllite and any fibrous amphibole.

Reason: The defined term should be revised to match the term used in the text. IgCC Section 805.1 uses the term 'Asbestos-containing materials'. The term 'asbestos-containing products' is not used in the text in the IgCC. Since a product could be made up of multiple materials, using 'materials' is more appropriate. The current text would prohibit materials with even a microscopic amount of asbestos. The change to the definition would match the EPA standards.

SECTION 805 PROHIBITED MATERIALS

805.1 Scope. The use of the following materials shall be prohibited:

1. Asbestos-containing materials.
2. Urea-formaldehyde foam insulation.

The intent of adding a 1% minimum is to coordination with Occupational Safety and Health Administration Standard Code of Federal Regulation (CFR) 29.1910, EPA Standard CFR 40 and ASTM E2356 -10 Standard Practice for Comprehensive Building Asbestos Surveys, Asbestos, Comprehensive building asbestos survey. OSHA Standard 1910, Occupational Safety and Health Standards, Subpart Z, Toxic and Hazardous Substances, Section (b) Definitions, defines Asbestos Containing Materials (ACM) as "any material containing more than 1% asbestos." EPA Standard Title 40, Protection of Environment, Part 61, National Emission Standards for Hazardous Air Pollutants, Subpart M, National Emission Standard for Asbestos Section §61.141, Definitions defines nonfriable asbestos-containing materials as "any material containing more than 1 percent asbestos as determined using the method specified in appendix E. Subpart E. 40 CFR part 763, section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. ASTM E2356 definitions for asbestos and asbestos-containing materials also specify 1%. The current IgCC definition is in direct conflict with these governing documents and would pick up even microscopic amounts of natural occurring asbestos. The change to asbestos-containing material and addition of greater than 1% will properly align the IgCC definition with the OSHA, EPA and ASTM standards.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/ks/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG 43-14 :202-ASBESTOS-CONTAINING PRODUCTS-PAARLBERG424

GG 44-14

1003.2.2, 202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Glenn Heinmiller, representing International Association of Lighting Designers (glenn@lampartners.com)

Delete and substitute as follows:

SECTION 202 DEFINITIONS

~~**TIME SWITCH CONTROL.** A device or system that automatically controls lighting or other loads, including switching ON or OFF, based on time schedules.~~

TIME SWITCH CONTROL. An automatic control device or system that controls lighting or other loads, including switching off, based on time schedules.

Revise as follows:

1003.2.2 Heating, ventilating and air-conditioning. Heating, ventilating and air-conditioning systems and equipment shall be in accordance with the following:

Heating, ventilating and air-conditioning systems and equipment shall be in accordance with the following:

1. Time clock and ~~automatic~~ time switch controls that can turn systems off and on according to building occupancy requirements shall be provided and connected to the following HVAC equipment: chillers and other space-cooling equipment, chilled water pumps, boilers and other space-heating devices, hot water pumps, heat exchanger circulation pumps, supply fans, return fans, and exhaust fans. Where occupant override is provided, it shall be designed with a timer to automatically revert to time clock and ~~automatic~~ time switch controls in not longer than 12 hours.

Exception: A time clock or ~~automatic~~ Time switch controls shall not be required for spaces where any of the following conditions exist:

1. A time clock is not required by Section C403.2.4.3 of the *International Energy Conservation Code*.
2. There is 24-hour occupancy materials with special atmospheric requirements dependent on 24-hour space conditioning.
3. A majority of the areas of the building served by the system are under setback thermostat control.

(No changes to remaining Items 2-8)

Reason: For conformance with the definitions approved in CE287 AMPC1/2 so that definitions for these lighting control devices will be identical in IGCC 2015 and IECC 2015.

Cost Impact: Will not increase the cost of construction.

GG 44-14 : 202-AUTOMATIC TIME SWITCH CONTROL-HEINMILLER597

GG45-14

202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: John Woestman, Kellen Company, representing Kellen Company, representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com)

Revise as follows:

SECTION 202 DEFINITIONS

BUILDING THERMAL ENVELOPE. ~~The basement walls, exterior walls, floor, roof, and any other building elements that enclose conditioned space including, but not limited to, above grade and below grade walls, ceiling, roof, and floor.~~ This boundary also includes the boundary between conditioned space and any exempt or unconditioned space.

Reason: Rearranging / revising to add emphasis that it is the building elements enclosing conditioned space which are the building thermal elements; and then including the common list of building elements.

Cost Impact: Will not increase the cost of construction

GG 45-14 : 202-BUILDING THERMAL ENVELOPE-WOESTMAN899

GG46-14

202 (New)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Add new definition as follows:

SECTION 202 DEFINITIONS

CLIMATE ZONE. A geographical region based on climate criteria as specified in the *International Energy Conservation Code*,

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/PagesJdefault.aspx>.

The term 'climate zone' has been used in the codes without a definition. The 'definition' was provided by the climate zone maps and listings in the IECC. To formalize the relationship the SEHPCAC has successfully gotten climate zone defined in the IBC during the Group A hearings, and via CE50 got the term defined in the IECC and the IRC. This proposal a definition for the IgCC consistent with the other approved definitions.

This is the original CE50 proposal. It was approved as modified with the language shown in this proposal above.

**CE50 -13
C202 (NEW), R202 (NEW) (IRC N1101.9 (NEW)), IRC 202 (NEW)**

Proponent: Brenda A. Thompson, Clark County Development Services, Clark County, Nevada, representing Sustainable/Energy/High Performance Code Action Committee (bat@clarkcounty.gov) PART I - IECC - COMMERCIAL PROVISIONS

Add new definition as follows:

SECTION C202 - GENERAL DEFINITIONS

CLIMATE ZONE. A geographical region that has been assigned climatic criteria as specified in this code. PART II - IECC - RESIDENTIAL PROVISIONS

Add new definition as follows:

SECTION R202 (N1101.9) GENERAL DEFINITIONS

CLIMATE ZONE. A geographical region that has been assigned climatic criteria as specified in this code

PART III - IRC

Add new definition as follows:

SECTION 202 - GENERAL DEFINITIONS

CLIMATE ZONE. A geographical region that has been assigned climatic criteria as specified in this code

Reason: There are increasing numbers of proposals in which the term 'climate zone' is used in the proposed code text. This has primarily occurred in the *International Building Code* and the *International Green Construction Code*. In 2012 at least 8 proposals heard in Dallas included the term. The Code Development Committees generally tried to make sure that each approved action included that it was Climate Zones as established in the IECC.

The SEHPCAC submitted public comments to G147-12 and G149-12 to remove individual references in the text of the IBC stating

that Climate Zones 'as established in the IECC' and proposed the inclusion in Chapter 2 of the IBC the following definition of Climate Zone.

CLIMATE ZONE. A geographic region that have been assigned climatic criteria as specified in Chapters 3CE and 3RE of the *International Energy Conservation Code*.

The public comments were approved by the membership and the definition is established in the IBC.

The proposed definition for the IECC is a further simplification of the version in the IBC as the extended reference isn't needed. The SEHPCAC reviewed the other codes which are part of Group B. Only the International Residential Code uses the term Climate Zone. This is addressed in Part III of this proposal. The intent of the public comments to the IBC was to simplify the reference each time Climate Zone is used to those zones 'defined' in the IECC. The issue is that 'Climate Zones' are established in the IECC, but there is no definition.

Cost Impact: Will not increase the cost of construction. The definition provides clarity without adding new regulations.

GG 46-14 : 202-CLIMATE ZONE (NEW)-THOMPSON57

GG47-14

202, 604.4, 608.1.3, 608.5, 611.3.1, 611.3.3.2

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Glenn Heinmiller, Lam Partners, Inc., representing International Association of lighting Designers (glenn@lampartners.com)

Revise as follows:

SECTION 202 DEFINITIONS

DAYLIGHT RESPONSIVE CONTROL. A device or system that provides automatic control of electric light levels based on the amount of daylight in a space.

Revise as follows:

608.1.3 Automatic Daylight responsive controls. Automatic Daylight responsive controls shall comply with Section C405.2 of the *International Energy Conservation Code*.

604.4 Lighting. In Group B office spaces, the Auto-DR system shall be capable of reducing total connected power of lighting as determined in accordance with Section C405.5 of the *International Energy Conservation Code* by not less than 15 percent.

Exception: The following buildings and lighting systems need not be addressed by the Auto-DR system:

1. Buildings or portions associated with lifeline services.
2. Luminaires on emergency circuits.
3. Luminaires located in emergency and life safety areas of a building.
4. Lighting in buildings that are less than 5,000 square feet (465 m²) in total area.
5. Luminaires located within a daylight zone that are dimmable and connected to automatic daylight responsive controls complying with Section C405.2.2.3.2 of the *International Energy Conservation Code*.
6. Signage used for emergency, life safety or traffic control purposes.

608.5 Automatic Daylight responsive controls. Automatic Daylight responsive controls shall be provided in daylight areas complying with Section 808.3.1 or Section 808.3.2 to control the lights serving those areas. General lighting in a sidelighting daylight area that is within one window head height shall be separately controlled by automatic daylight responsive controls.

Exception: Automatic Daylight responsive controls are not required for the following spaces and equipment:

1. Toplighting daylight areas where the skylight is located in a portion of the roof that is shaded during the peak sun angle on the summer solstice by permanent features of the building or by permanent features of adjacent buildings.
2. Sidelighting daylight areas where the fenestration is located in an obstructed exterior wall that does not face a public way or a yard or court complying with Section 1206 of the *International Building Code* or where the distance to any buildings, structures, or geological formations in front of the wall is less than two times the height of the buildings, structures, or geological formations.
3. Daylit areas served by less than 90 watts of lighting.
4. Spaces where medical care is directly provided.
5. Spaces within dwelling units or sleeping units.

6. Lighting required complying with Section C405.2.3 of the *International Energy Conservation Code*.

611.3.1 Preconstruction documentation, lighting. Construction and owner education documents shall include floor plans, diagrams and notations of sufficient clarity describing the types of, location and operational requirements of all lighting controls including a sequence of operation and preliminary intended setpoints for all dimming systems and a Automatic daylight responsive controls, demonstrating conformance to the provisions of this code, relevant laws, ordinances, rules and regulations, as approved by the code official.

611.3.3.2 Automatic Daylight responsive controls. Automatic Daylight responsive controls shall be commissioned in accordance with all of the following:

1. It shall be verified that the placement and orientation of each sensor is consistent with the manufacturer's instructions. If not, the sensor shall be relocated or replaced.
2. Control systems shall be initially calibrated to meet settings and design intent established in the construction documents.
3. Prior to calibration of systems controlling dimmable luminaires, all lamps shall be seasoned in accordance with the recommendations of the lamp manufacturer.
4. Where located inside buildings, calibration of open-loop daylight responsive controls, which receive illumination from natural light only, shall not occur until fenestration shading devices such as blinds or shades have been installed and commissioned.
5. Calibration of closed-loop daylight responsive controls, that receive illumination from both natural and artificial light, shall not occur until furniture systems and interior finishes have been installed, and any fenestration shading devices such as blinds or shades have been installed and commissioned.
6. Calibration procedures shall be in accordance with the manufacturer's instructions.

Reason: For conformance with the definitions approved in CE287 AMPC1/2 so that definitions for these lighting control devices will be identical in IGCC 2015 and IECC 2015.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code sections C405.5 and C405.2.2.3.2 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Editions will be C405.4 and C405.2.3, respectively.

GG 47-14: 202-DAYLIGHT CONTROL-HEINMILLER598

GG 48-14

202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Julie Ruth, JRuth Code Consulting, representing American Architectural Manufacturers Association (julruth@aol.com)

Add new definition as follows:

SECTION 202 DEFINITIONS

VERTICAL FENESTRATION. Windows (fixed or moveable), opaque doors, glazed doors, glazed block, and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of at least 60 degrees (1.05 rad) from horizontal.

Revise as follows:

~~**SKYLIGHTS AND SLOPED GLAZING.** Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal. Glazing material in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls, are included in this definition.~~

Delete and substitute as follows:

~~**FENESTRATION.** Skylights, roof windows, vertical windows (fixed or moveable), opaque doors, glazed doors, glazed block, and combination opaque/glazed doors. Fenestration includes products with glass and nonglass glazing materials.~~

FENESTRATION. Products classified as either vertical fenestration or skylights.

Reason: The intent of this proposal is to improve the consistency between the 2015 IECC and the 2015 IgCC. During the ICC Group B hearings the definition of fenestration and skylights and sloped glazing were revised to distinguish between vertical and sloped glazing, while retaining both within the overall definition of fenestration. The intent of this proposal is to bring the revised definition from the 2015 IECC into the 2015 IgCC.

The end result of this proposal is intended to have Chapter 2 read as follows:

FENESTRATION: Products classified as either vertical fenestration or skylights.

Vertical Fenestration. Windows (fixed or moveable), opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of at least 60 degrees (1.05 rad) from horizontal.

Skylight. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal.

The separate definition for "skylights and sloped glazing" will be deleted.

Cost Impact: Will not increase the cost of construction.

GG 48-14 : 202-FENESTRATION #2-RUTH937

GG49-14 202

Proponent: Karen Hobbs, representing Natural Resources Defense Council (khobbs@nrdc.org)

SECTION 202 DEFINITIONS

Revise as follows:

FLOOD OR FLOODING. A general and temporary condition of partial or complete inundation of normally dry land from:

1. The overflow of inland or tidal waters.
2. The unusual and rapid accumulation of runoff of surface waters from any source.
3. The collapse or subsidence of a streambank bluff, or other land along a body of water, as a result of erosion caused by currents of water exceeding anticipated cyclical levels that result in a flood as defined by Item 1 or 2.

Reason: This additional phrase about erosion to define flooding is needed because flood damage is as much associated with inundation-related losses as with unstable channels and riverbank collapse. This change would align the definition in the IGCC with FEMA's definition (see <http://www.fema.gov/national-flood-insurance-program/definitions#F>).

Cost Impact: Will not increase the cost of construction.

GG 49-14: 202-FLOOD OR FLOODING-HOBBS883

GG50-14

202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

SECTION 202 DEFINITIONS

GRAY WATER. ~~Untreated waste water that has not come into contact with waste water from water closets, urinals, kitchen sinks, or dishwashers. Gray water includes, but is not limited to, Waste water from bathtubs, showers, lavatories, clothes washers, and laundry trays.~~

Reason: Consistency between the codes. The definition in IgCC Chapter 2 isn't the same as in the IPC. This proposal revises the IgCC definition to align with the IPC definition. Note that Chapter 7 of the IgCC relies on many requirements of the IPC.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG50-14 : 202-GRAY WATER-THOMPSON297

GG51-14

202, 202 (New)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Delete and substitute as follows:

SECTION 202 DEFINITIONS

~~**GROUND SOURCE OR GEOEXCHANGE.** Where the earth is used as a heat sink in air conditioning or heat pump island systems. This also applies to systems utilizing subsurface water. Ground source heating and cooling uses the relatively constant temperature of the earth below the frost line. This steady temperature profile allows the earth to be used as a heat source in the winter and as a heat sink in the summer.~~

GEOEXCHANGE. Systems that utilize the earth as a heat source or heat sink, including systems utilizing subsurface water or subsurface steam.

Add new definition as follows:

GROUND SOURCE. See "Geoexchange".

Reason: The current definition contains a great deal of extraneous information.

Cost Impact: Will not increase the cost of construction.

GG51-14 : 202-GROUND SOURCE OR GEOEXCHANGE-BAILEY586

GG52-14 202

Proponent: John Woestman, Kellen Company representing Composite Lumber Manufacturers Association (CLMA), representing Kellen Company representing Composite Lumber Manufacturers Association (CLMA) (jwoestman@kellencompany.com)

Revise as follows:

SECTION 202 DEFINITIONS

HARDSCAPE. ~~Paved areas of on a building site covered by manmade materials.~~

Reason: The current definition of hardscape could be interpreted broadly to include many manmade items covering a building site that are commonly not considered hardscape, including solar panels, solar thermal collectors, gazebos, swimming pools, parking ramps, and buildings and structures.

The Commentary for 2012 IGCC Section 408.2, describes hardscape as paved surfaces: "Hardscapes" are defined in Chapter 2 as areas of the building site covered by man-made materials. Generally this means paving of some kind. The primary uses will be paving for parking lots, bicycle parking, plazas and patios as well as sidewalks, bicycle paths and other pathways. Under this section

.....

The proposed revision to the IGCC definition of hardscape is consistent with the use and requirements for hardscapes in the IGCC and is consistent with the ASHRAE 189.1-2011 definition for hardscape:

hardscape: *site paved* areas including roads, driveways, parking lots, walkways, courtyards, and plazas.

Cost Impact: Will not increase the cost of construction.

GG52-14 : 202-HARDSCAPE-WOESTMAN907

GG53-14

A103.1 (New), A105, A105.8 (New),

Proponent: John Cross, representing American Institute of Steel Construction (cross@aisc.org)

Revise as follows:

**TABLE A105
MATERIAL RESOURCE CONSERVATION AND EFFICIENCY**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED	
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 4 to establish the minimum total number of project electives that must be satisfied.	—	
A105.1	Waste management	<input type="checkbox"/> Yes	<input type="checkbox"/> No
A105.2	Construction waste landfill maximum	<input type="checkbox"/> Yes	<input type="checkbox"/> No
A105.3(1)	Reused, recycled content, recyclable, bio-based and indigenous materials (70%)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
A105.3(2)	Reused, recycled content, recyclable, bio-based and indigenous materials (85%)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
A105.4	Service life plan	<input type="checkbox"/> Yes	<input type="checkbox"/> No
A105.5	Design for deconstruction and building reuse	<input type="checkbox"/> Yes	<input type="checkbox"/> No
A105.6	Existing building reuse	<input type="checkbox"/> Yes	<input type="checkbox"/> No
A105.7	Historic building reuse	<input type="checkbox"/> Yes	<input type="checkbox"/> No
A105.8	Integrated design	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Add new text as follows:

A105.8 Integrated design project elective. The use of an integrated design process by the design team shall be considered a project elective.

Add new definition as follows:

SECTION A103.1 DEFINITIONS

Integrated design process. A design process utilizing early, multi-disciplinary collaboration among the representatives of each stakeholder and participating consultant on the project. The focus of the process is on the building as an interdependent system as opposed to an accumulation of its separate components.

Reason:

1. Integrated, collaborative design and construction can enhance project productivity (cost, speed, quality, and safety) by as much as 20% while minimizing the life cycle impacts of the project from construction through operation and ultimate demolition. The 20% productivity enhancement and 25% reduction of environmental impacts has been documented on numerous structural steel projects where a combination of a design- build approach and Building Information Modeling has been utilized.
2. Effective knowledge of construction practices that minimize waste, optimize transportation requirements, improve project safety, minimize construction processes, improve project quality and accelerate project schedules rest not with designers but with the specialty contractors that serve the project. Please see the best practices guidelines of the Design-Build Institute of America, Selecting Specialty Contractors.
3. Recent advances in integrated design using Building Information Modeling (BIM) as a collaborative tool allow projects to be "built twice" - once virtually and once in the field. This process allows construction questions to be answered during the virtual

phase rather than in the field. Physical interferences are identified and eliminated reducing the need for duplicate field work for installation, de-installation, and re-installation of conflicting systems. NIST has quantified the cost savings related to just a portion of this improvement in excess of \$6 per square foot. While cost is not the primary driver for high-performance green buildings, the cost savings directly reduce site activity. Additional long-term savings are gained through the facility management advantages of the Building Information Model further reducing the Life Cycle Cost of the structure.

4. No other single action that could be taken under the banner of sustainable construction could be more significant than to mandate collaborative design. Integrated design in its broadest sense allows every member of the design and construction team to optimize their activities to minimize energy and environmental impacts.

While it may be premature from a practical standpoint to require projects to use an integrated design approach, projects that opt to use such an approach should be recognized for that approach. For that reason this proposal is submitted as a project elective rather than a project requirement.

Cost Impact: Will not increase the cost of construction. Evidence shows a decrease in the cost of construction.

GG53-14 : 202-INTEGRATED DESIGN PROCESS-CROSS703

GG54-14 202

Proponent: Doug Johnson, representing California Invasive Plant Council (dwjohnson@cal-ipc.org);
Read Porter (porter@eli.org)

SECTION 202 DEFINITIONS

Revise as follows:

INVASIVE PLANT SPECIES. Species that are not native to the ecosystem under consideration and that cause, or are likely to cause, economic or environmental harm or harm to human, animal or plant health, defined by using the best scientific knowledge of that region. ~~Consideration for inclusion as an~~ Invasive species shall include, but shall not be limited to, those species identified on:

1. *Approved* city, county or regional lists.
2. State noxious weeds laws,
3. Federal noxious weeds laws.

Reason: The current wording, "Consideration for inclusion..." is vague and leaves the determination of invasive plants entirely up to the builder. It does not require that any plant on the following lists actually be included on the site list. This revision removes that loophole.

Cost Impact: Will not increase the cost of construction. None.

GG54-14 : 202-INVASIVE PLANT SPECIES #1-JOHNSON1051

GG55-14

202

Proponent: Doug Johnson, representing California Invasive Plant Council (dwjohnson@cal-ipc.org);
Read Porter (porter@eli.org)

Revise as follows:

SECTION 202 DEFINITIONS

INVASIVE PLANT SPECIES. Species that are not native to the ecosystem under consideration and that cause, or are likely to cause, economic or environmental harm or harm to human, animal or plant health, defined by using the best scientific knowledge of that region. Consideration for inclusion as an invasive species shall include, but shall not be limited to, those non-native species identified on:

1. *Approved* city, county or regional lists.
2. State noxious weeds laws,
3. Federal noxious weeds laws.

Reason: The definition for invasive plant species specifically refers to non-native species, but the reference to state and federal noxious weed laws has the potential to cause confusion since noxious weed laws sometimes include native plant species (which can be agricultural pests in cultivated settings). The term "non-native" is added to clarify that native plants included in noxious weed laws are not considered invasive plants for the purposes of this definition.

Cost Impact: Will not increase the cost of construction.

GG55-14 : 202-INVASIVE PLANT SPECIES #2-JOHNSON1058

GG56-14

202

Proponent: Doug Johnson, representing California Invasive Plant Council (dwjohnson@cal-ipc.org);
Read Porter (porter@eli.org)

Revise as follows:

SECTION 202 DEFINITIONS

INVASIVE PLANT SPECIES. Species that are not native to the ecosystem under consideration and that cause, or are likely to cause, economic or environmental harm or harm to human, animal or plant health, defined by using the best scientific knowledge of that region. Consideration for inclusion as an invasive species shall include, but shall not be limited to, those species identified on:

1. *Approved* city, county or regional lists.
2. State noxious weeds laws, state invasive plant laws, and state invasive species laws,
3. Federal noxious weeds laws.

Reason: Noxious weed laws are not the only state laws pertinent to this definition. The proposed change adds other relevant laws that are found in some states.

Cost Impact: Will not increase the cost of construction

GG56-14 : 202-INVASIVE PLANT SPECIES #3-JOHNSON1062

GG57-14 202, Chapter 12

Proponent: Doug Johnson, representing California Invasive Plant Council (dwjohnson@cal-ipc.org);
Read Porter (porter@eli.org)

Revise as follows:

SECTION 202 DEFINITIONS

INVASIVE PLANT SPECIES. Species that are not native to the ecosystem under consideration and that cause, or are likely to cause, economic or environmental harm or harm to human, animal or plant health, defined by using the best scientific knowledge of that region. Consideration for inclusion as an invasive species shall include, but shall not be limited to, those species identified on:

1. *Approved* city, county or regional lists.
2. Lists developed in accordance with ASTM WK40773 for the region where the building site is located.
3. State noxious weeds laws,
4. Federal noxious weeds laws.

Add new standard(s) as follows:

ASTM

WK40773 New Practice for Invasive Plant Listing

Reason: The WK40773 work item is an invasive plant listing standard underway at ASTM which is expected to be published in 2014. The work item can be supplied if necessary.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM WK40773-XXXX with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG57-14 : 202-INVASIVE PLANT SPECIES #4-JOHNSON1065

GG58-14

202, Chapter 12

Proponent: Gregory Johnson, representing self (gjohnsonconsulting@gmail.com)

Delete and substitute as follows:

SECTION 202 DEFINITIONS

~~**NATIVE PLANT SPECIES.** Species that are native to the ecosystem under consideration, defined by using the best scientific knowledge of that region. Consideration for inclusion as a native species shall include, but is not limited to, those species identified in any of the following:~~

- ~~1. Approved city, county and regional lists.~~
- ~~2. State laws.~~
- ~~3. Federal laws.~~

NATIVE PLANT SPECIES. Plant species that are identified as native in the PLANTS Database of the United States Department of Agriculture, Natural Resources Conservation Service or identified as native by city, county, state, or regional governmental bodies.

Add new standard(s) as follows:

US Department of Agriculture, Natural Resources Conservation Service PLANTS Database

Reason: The current definition of native plant species is unenforceable. “*Native to the ecosystem under consideration*” requires the code official to make a subjective evaluation of what exactly the ecosystem is. Similarly, “*defined by using the best scientific knowledge of that region*” is completely subjective. Who provides the best scientific knowledge of the region? USDA? EPA? The state’s Department of Natural Resources? The Parks Department? “*Consideration for inclusion*” also requires the code official to make a subjective decision that could very well violate Federal or state preemptions – a code official only has to consider state and Federal laws rather than follow them.

The reference to the PLANTS database removes all subjectivity from the definition; a plant species is either identified as native by PLANTS or not; a code official merely needs to verify the plant’s status in the database to know if it complies. Similarly, if the local jurisdiction has already specified or listed local native plants a simple reference to those specifications or lists is friendliest to code users.

The US Department of Agriculture Natural Resources Conservation Service PLANTS Database can be found at <http://plants.usda.gov/java/>

Bibliography:

Don’t Judge Species on Their Origins; Nature 474,153–154 (09 June 2011):
http://www.icevolution.org/dbase_upl/NatureInvasives2011.pdf

Cost Impact: Will not increase the cost of construction

GG58-14 : 202-NATIVE PLANT SPECIES-JOHNSON150

GG59-14 202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IGCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IGCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Glenn Heinmiller, Lam Partners, Inc., representing International Association of Lighting Designers (glenn@lampartners.com)

Revise as follows:

SECTION 202 DEFINITIONS

OCCUPANT SENSOR CONTROL. A An automatic device or system that detects the presence or absence of people within an area and causes lighting, equipment, or appliances to be regulated accordingly.

Reason: For conformance with the definitions approved in CE287 AMPC 1/2 so that definitions for these lighting control devices will be identical in IGCC 2015 and IECC 2015.

Cost Impact: Will not increase the cost of construction.

GG59-14 : 202-OCCUPANT SENSOR CONTROL-HEINMILLER599

GG60-14

202

Proponent: Richard Krock, representing The Vinyl Institute (rkrock@vinylinfo.org)

Add new definition as follows:

SECTION 202 DEFINITIONS

PLASTIC. See "Polymeric material".

POLYMERIC MATERIAL. A material or product that is composed of, in-whole or in-part, polymers that are created by the process of polymerization or the joining together of organic chemical structures (monomers), derived from natural or synthetic raw materials, to form large molecules containing many repeating organic chemical units. Polymeric materials are generally categorized as thermoplastic or thermosetting, and can be formulated to contain additives including inorganic or organic chemical fillers, fibers, reinforcements, pigments, and non-polymeric ingredients depending on the end use application of the product.

Reason: The term "plastic" (as a material type) is used in the 2012 IgCC in Sections 707.11.1, 708.12.6.2, 803.1.1. Within the plastics industry, the more specific term of "polymeric material" is used to better understand the make-up and configurations of plastic for the purposes of understanding the recycle-ability requirements in the code.

Although the term "polymeric materials" *could* be used in all locations where the term "plastic" is currently used in the code, the term could be too confusing to many code users. This is the reason for keeping the simple term "plastic" but having the term point to the industry specific term (polymeric materials) in order to describe the characteristics of the material.

Another proposal for revising Section 505.2.2 will present the same definition.

Cost Impact: Will not increase the cost of construction

GG60-14 : 202-POLYMERIC MATERIAL (NEW)-KROCK927

GG61-14

202

Proponent: Maureen Traxler, representing City of Seattle Dept. of Planning & Development
(maureen.traxler@seattle.gov)

Revise as follows:

SECTION 202 DEFINITIONS

REPAIR. The reconstruction or renewal of any part of an existing building or building site for the purpose of its maintenance or to correct damage.

Reason: This proposal correlates the IGCC with the IBC, IEBC, IECC-C, IECC-R, IRC and ISPS. Correction of damage was added to the definition of repair in those codes by ADM60-13 and CE4-13. The definition does not appear in any of the other International codes.

Limiting repairs to maintenance is not consistent with the common use of the word. If a tree falls on your house, you repair the damage to the roof. Limiting repairs to maintenance is also inconsistent with the use of the term in the IGCC and other codes. Two definitions in the IGCC assume that correction of damage is repair work. Roof replacement includes "repairing any damaged substrate". The definition of substantial improvement states "If the structure has sustained substantial damage, any repairs are considered substantial improvement..." IBC Section 3405.1 (2012 IBC) and IEBC Section 404.1, "Repairs", specifically state that repair includes correction of damage. "Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered part of the repair and shall not be subject to the requirements for *alterations* in this chapter." IEBC Section 606.2 deals with repairs to damaged buildings—explicitly including correction of damage, which in many cases would be more than "maintenance".

Cost Impact: Will not increase the cost of construction.

GG61-14 : 202-REPAIR-TRAXLER481

GG62-14 202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: John Woestman, Kellen Company, representing Kellen Company representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com)

Revise as follows:

SECTION 202 DEFINITIONS

R-VALUE (THERMAL RESISTANCE). The inverse of the time rate of heat flow through a ~~body~~ building material from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \times ft^2 \times ^\circ F/Btu$) [$m^2 \times K/W$].

Reason: Very slight revision to definition to be consistent with the existing IgCC definition of U-FACTOR (THERMAL TRANSMITTANCE). The coefficient of heat transmission (air to air) through a building component or assembly.

Cost Impact: Will not increase the cost of construction.

GG62-14 : 202-R-VALUE (THERMAL RESISTANCE)-WOESTMAN905

GG63-14 202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Glenn Heinmiller, Lam Partners, Inc., representing International Association of Lighting Designers (glenn@lampartners.com)

Revise as follows:

SECTION 202 DEFINITIONS

SEQUENCE OF OPERATIONS (HVAC). A fully descriptive detailed account of the intended operation of HVAC energy using systems covering the operation of systems in narrative terms, accounting for all of the equipment that makes up the systems, how the systems are designed to operate, and how they are to be controlled.

Reason: Sequence of operations are not limited to HVAC systems. They are also used to describe the detailed functioning of lighting control systems.

Cost Impact: Will not increase the cost of construction.

GG63-14 : 202-SEQUENCE OF OPERATIONS(HVAC)-HEINMILLER595

GG64-14 202

Proponent: Susan Gitlin, representing US Environmental Protection Agency
(gitlin.susan@epa.gov)

Revise as follows:

SECTION 202 DEFINITIONS

SITE DISTURBANCE. Site preparation or construction which negatively affects the ~~native soils or~~ native vegetation, ~~or native animal life~~ of the site.

Reason:

1. The definition for “site disturbance” currently in IGCC is inconsistent with how the term is used in the code. For example, Section 402.8 creates a jurisdiction requirement that limits “site disturbance or development ...on *greenfield sites*.” Greenfield sites, however, by definition, may have a history of agricultural use. In that case, the soil would not be native, per se. Yet, it is the intent of Section 402.8 to – when selected by the jurisdiction that adopts the code – to protect greenfield sites, whether or not they retain pre-Columbian era soils, plants, or animals. If the section were limited to such sites, it would have little to no applicability to the US east of the Mississippi.
2. This definition would not protect soils that had been restored to a level that was functionally equivalent to that of native soils, but were not, in fact, native. For example, sections 402.5 and 402.6 limit site disturbance in conservation areas and on park land. It is often the case that a private or public organization has invested heavily in restoring the soil conditions of such areas in order to better support the local ecosystem or to create a recreational area. Such soil might be akin to native conditions in some ways, but could not truly be considered “native.” The intent of the code would seem to be to protect such restored areas – or other areas with healthy soils – but the definition of “site disturbance” would not require such protection.
3. The code does not define “native soils” or “native animals,” leaving a great deal of ambiguity in this definition.
4. It could be impossible for construction to take place without disturbing animal life. For example, how might a contractor, in an attempt to comply with section 402.8.1, avoid disturbing a mockingbird that has nested in a shrub within 50 feet of the perimeter of a building? It is unavoidable that the presence of humans – and the noise of the equipment will disturb the birds. In this case, it is more important that the soils and vegetation be retained so that animal life does not lose its habitat. It is too much to ask that the animal life not be “negatively affected.”

One approach to handling the problems with this definition would be to delete it in its entirety, as “site disturbance” is a fairly clear term on its own. The other approach is, as proposed here, to delete the word “native” in the three places it occurs in the definition and delete the reference to animals.

Cost Impact: Will not increase the cost of construction.

GG64-14 : 202-SITEDISTURBANCE-GITLIN834

GG65-14

202

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

Revise as follows:

SECTION 202 DEFINITIONS

SITE DISTURBANCE. Site preparation or construction which ~~negatively~~ affects the native soils, native vegetation, or native animal life of the site. Normal maintenance of soils or vegetation shall not be construed as site preparation or construction.

Reason: The intent of this proposal is to broaden the application of "site disturbance" to any effect on the native soils, native plants, or native animals, whether positive or negative.

"Site disturbance" appears in Sections 402.2.1 and 402.2.2 (flood hazard areas), 402.5 (conservation areas), 402.6 (park land), 402.8 and 402.8.1 (greenfields), and Table 903.1 (commissioning). In all of the sections except Table 903.1, the context and the IgCC Commentary indicate the intent is to prohibit any disturbance of native soils, plants, or animals. See especially the commentary to Section 402.2.1, where "negatively" is omitted in the fifth sentence of the first paragraph, which is restating the definition of "site disturbance."

It is also to be noted that whether a particular change that impacts soil, plants, or animals is "positive" or "negative" can be very subjective, and subject to debate.

The proposed change aligns the definition with the apparent intent of the code, and removes some of the subjectivity in the definition.

The added text is intended to allow normal maintenance activities such as gardening to occur, without triggering the restrictions.

Cost Impact: Will increase the cost of construction. If the intent of the code as explained in the Commentary is followed, there will be no impact on the cost of construction. However, if the text of the definition is followed exactly, then this proposal expands the areas where development will be prohibited. Note that prohibiting construction in more areas does not necessarily directly result in higher construction costs.

GG65-14 : 202-SITE DISTURBANCE-SIU582

GG66-14

202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Jim Huggins, representing Solar Rating & Certification Corp. (jhuggins@solar-rating.org)

Revise as follows:

SECTION 202 DEFINITIONS

SOLAR THERMAL EQUIPMENT. A device that uses solar radiation to heat water, water or air or a heat transfer fluid for use within the facility for to provide heat for service water heating, process heating, space heating or space cooling within a facility.

Reason: The definition for Solar Thermal Equipment could be misinterpreted to mean that solar systems must use only water or air. The majority of solar water heating systems use an antifreeze fluid in the collector loop. This proposal simply clarifies that other heat transfer fluids can be used.

Cost Impact: Will not increase the cost of construction. This is just a clarification in a definition.

GG66-14 : 202-SOLAR THERMAL EQUIPMENT-HUGGINS1077

GG67-14

203

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

SECTION 202 DEFINITIONS

SOLAR THERMAL EQUIPMENT. A device that uses solar radiation to heat water or air for use within the facility for service water heating, process heat, space heating or space cooling, using a heat transfer fluid.

Reason: The definition for Solar Thermal Equipment currently excludes the majority of solar water heating systems since most use an antifreeze fluid in the collector loop. This proposal simply expands the coverage from 'water or air' to include all heat transfer fluids.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG67-14 : 202-SOLAR THERMAL EQUIPMENT-THOMPSON735

GG68-14

202

Proponent: Brenda Thompson, representing SEHPCAC

Revise as follows:

SECTION 202 DEFINITIONS

VEGETATIVE ROOF. ~~An assembly of Interacting components on or integral to the roof designed to waterproof and normally insulate a building's top surface that includes, by design, vegetation, gardens or and related landscaping elements.~~

Reason: The use of vegetative roofs in the IgCC is about addressing heat island impact. The standards for vegetative roofs address neither insulation nor waterproofing and, therefore, the definition goes too far.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG68-14 : 202-VEGETATIVE ROOF-THOMPSON299

GG69-14

202

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: David Collins, Preview Group, representing AIA (dcollins@preview-group.com)

Revise as follows:

SECTION 202 DEFINITIONS

ZERO ENERGY PERFORMANCE INDEX (zEPI). A scalar representing value that is representative of the ratio of energy performance of based on the proposed design compared to the average energy performance of buildings relative to a benchmark year a comparative baseline building and its site.

Reason: The current definition of zEPI is confusing and unclear. zEPI simply describes the relationship between what is being designed and what is allowed by the baseline energy design and establishes a simple method of comparison. By revising the definition and modifying how zEPI is used in the code all users of the IgCC will better understand what is intended.

Cost Impact: Will not increase the cost of construction.

GG69-14 : 202-ZEPI-COLLINS619

GG70-14

202, Chapter 12

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Jim Edelson, New Buildings Institute, representing NBI (edelson8@gmail.com)

Revise as follows:

SECTION 202 DEFINITIONS

ZERO ENERGY PERFORMANCE INDEX (zEPI). A scalar representing the ratio of the energy performance of ~~the~~ a proposed design or an existing building compared to the ~~average~~ average-mean energy performance of the buildings stock relative to a from the benchmark year of 2000 as represented by the data in the Commercial Building Energy Consumption Survey by the United States Department of Energy.

Add new standard as follows:

DOE

Commercial Building Energy Consumption Survey by the United States Department of Energy <http://www.eia.gov/consumption/commercial/>

Reason: The concept of a zEPI-type scale was originally outlined by Charles Eley in *Rethinking Percent Savings*, 2009. In describing the zEPI concept, Eley concluded:

The interesting thing is that after 30 years of energy codes, it may be possible to come full circle and once again embrace a form of fixed energy targets, at first for energy labels and green building ratings but eventually for code compliance. This would be made possible through the use of the recommended scale for specifying the target and the goals for zero net-energy buildings within a reasonable timeframe.

The proponents of this proposal, with others, successfully proposed the zEPI concept into the 2012 IgCC. However, the zEPI proposal for a modeled path was approved, while the additional zEPI proposal for the outcome-based path was not approved. The published zEPI definition did not account for each of the uses for which zEPI is intended and may be used in the IgCC. In addition, the definition overgeneralizes zEPI by omitting its peg to the 2000 CBECS survey. This proposal corrects both of those features in the current definition.

The Commercial Building Energy Consumption Survey by the United States Department of Energy can be found at <http://www.eia.gov/consumption/commercial/>

Cost Impact: Will not increase the cost of construction.

GG70-14 : 202-ZEPI-EDELSON784

GG71-14

301, 301.1, 301.1.1, 301.2, 302, 302.1, 302.1.1

Proponent: Craig Conner, representing self (craig.conner@mac.com)

Delete without substitution:

**SECTION 301
GENERAL**

**SECTION 302
JURISDICTIONAL REQUIREMENTS**

Reason: Jurisdictional requirements are confusing. For example the residential option is spread across two chapters. Likewise with the ASHRAE requirements. Most of the jurisdictional option are attached to sections that should be themselves deleted.

Cost Impact: Will not increase the cost of construction.

GG 71-14 : 301-CONNER1210

GG72-14

301.1.1

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Brickfield, Burchette, Ritts & Stone (gas@bbrslaw.com); Brian Dean (Brian.Dean@icfi.com); William Prindle (william.prindle@icfi.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello (misuriello@verizon.net)

Revise as follows:

301.1.1 Application. The requirements contained in this code are applicable to buildings, or portions of buildings. As indicated in Section 101.3, these buildings shall ~~meet either the requirements of ASHRAE 189.1 or the requirements contained in either~~ demonstrate compliance with this code or demonstrate compliance with ASHRAE 189.1. Buildings complying under ASHRAE 189.1 shall also demonstrate compliance with the applicable codes listed in Section 102.4.

Reason: This proposal clarifies two key aspects of the ASHRAE 189.1 alternative and maintains internal consistency throughout the IgCC:

Whether a code user selects the IgCC or ASHRAE 189.1 as the method of compliance, all the requirements of the selected code must be met. We do not believe the drafters intended to allow code users to cherry-pick requirements from both codes. As written, the current language could possibly be misinterpreted to permit users to game the system.

Although IgCC Section 102.4, if properly interpreted, requires projects (regardless of compliance path selected) to comply with all applicable International Codes, that requirement should also be clearly stated in Chapter 3 with regard to the ASHRAE 189.1 compliance path, to avoid any confusion. This will clarify the requirements for those users who only focus on section 301 and choose the ASHRAE alternative. While compliance with ASHRAE 189.1 is permitted as an alternative to the requirements of the IgCC, selecting that option should not release a code user from building a safe, durable, resilient building per the requirements of the other International Codes. Permitting users to avoid the requirements of the underlying codes simply by choosing the ASHRAE compliance path would provide the wrong incentive to use ASHRAE in lieu of the IgCC.

This proposal properly reorders the compliance options under the IgCC – since this is the IgCC, instead of listing ASHRAE 189.1 first, compliance with the IgCC should be the primary compliance option and ASHRAE 189.1 should be the alternative.

The changes above do not add any new requirements to the current Section 301.1.1; rather, they clarify the proper interpretation of the Application section across all compliance options.

Cost Impact: Will not increase the cost of construction.

GG72-14: 301.1.1-STONE901

GG73-14

101.3, 101.3.1, 302.1

Proponent: Hope Medina, representing Cherry Hills Village (hmedina@coloradocode.net)

Revise as follows:

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located. Occupancy classifications shall be determined in accordance with the *International Building Code*[®] (IBC[®]).

Exceptions:

- ~~1. The code shall not apply to items 1.1, 1.2 and 1.3 except where the jurisdiction adopts the jurisdictional requirements of Section 302.1, Item 1, for residential buildings.~~
 - ~~1.1. Detached one and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located.~~
 - ~~1.2. Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located.~~
 - ~~1.3. Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located.~~
- 1 ~~2.~~ The code shall not apply to equipment or systems that are used primarily for industrial or manufacturing.
- 2 ~~3.~~ The code shall not apply to temporary structures *approved* under Section 3103 of the *International Building Code*.
- 3 ~~4.~~ Where ASHRAE 189.1 is selected in accordance with Section 301.1.1, ASHRAE 189.1 shall not apply to buildings identified in Exceptions 1 through 3.

Delete without substitution:

101.3.1 Residential construction. ~~In lieu of the requirements of this code the following shall be deemed to comply with this code:~~

- ~~1. Group R-2 and R-4 residential buildings five stories or more in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located that comply with ICC 700, with a minimum energy efficiency category requirements of the Silver performance level or equivalent.~~
- ~~2. Group R-2 and R-4 portions of mixed-use buildings that comply with ICC 700, with a minimum energy efficiency category requirements of the Silver performance level or equivalent. The remainder of the building and the site upon which the building is located shall comply with the provisions of this code.~~

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

- ~~1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting "Yes" or "No" in Table 302.1.~~

Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.

2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 1. SCOPE			
401.3 Exception 1.1	Detached one and two family dwellings and multiple single family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
401.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
401.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

Reason: This code is an overlay code for sustainable construction of commercial buildings, so requirements for residential construction should not be brought into the IgCC. The residential standard, National Green Building Standard ICC 700, states the provisions of this Standard shall apply to design and construction of the residential portion(s) of any building, not classified as an institutional use, in all climate zones. This Standard shall apply to subdivisions, building sites, building lots, accessory structures, and the residential portions of alterations, additions, renovations, mixed-use buildings, and historic buildings. The IgCC, which is an overlay code, and ICC 700 (NGBS), which is a standard, should not have intermingling requirements in the IgCC.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG73-14 : 302.1-MEDINA1028

GG74-14

301.2, 302.1, Table 302.1, 302.1.1, 303.1, 401.1, 401.2, 402.1, 402.2, 402.2.1, 402.2.2, 402.2.3, 402.3, 402.4, 402.5, 402.6, 402.7, 402.8, 406.2, 407.4, 409.1, 501.1, 503.1, 601.3, 601.3.1, 601.3.2, 601.4, 603.1, 604.1, 701.1, 702.7, 801.1, 804.2, 807.1, 1001.3, 1002.1, 1003.1, 1007.1, 1007.2.1, 1007.2.2, 1101.3, 1102.1, 1103.1, 1104.1

Proponent: Kathleen Petrie, City of Seattle Department of Planning and Development, representing City of Seattle (kathleen.petrie@seattle.gov)

Revise as follows:

301.2 Jurisdictional requirements. ~~This chapter requires that the~~ The jurisdiction shall indicate in Table 302.1 whether specific provisions are mandatory for all buildings regulated by this code and, where applicable, the level of compliance required. ~~All other provisions of this code shall be mandatory as applicable.~~

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. ~~Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.~~
23. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 1. SCOPE			
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 3. LIFE CYCLE ASSESSMENT			
<u>303.1</u>	<u>Whole building life cycle assessment</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 4. SITE DEVELOPMENT AND LAND USE			
401			
<u>401.1</u>	<u>Predesign site inventory and assessment</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Section	Section Title or Description and Directives	Jurisdictional Requirements	
<u>402</u>			
<u>402.1</u> <u>402.2.1</u>	Flood hazard area preservation, general	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.2</u> <u>402.2.2</u>	Flood hazard area preservation, specific	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.3</u>	<u>Development in flood hazard areas</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.4</u> <u>402.3</u>	Surface water protection	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.5</u>	<u>Wetland protection</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.5</u> <u>402.6</u>	Conservation area	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.7</u>	<u>Park land</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.8</u> <u>402.7</u>	Agricultural land	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.9</u> <u>402.8</u>	Greenfield sites	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>403</u>			
<u>403</u>	<u>Stormwater management</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>404</u>			
<u>404.1</u>	<u>Landscape irrigation systems</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>404.2</u>	<u>Outdoor fountains</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>405</u>			
<u>405.1</u>	<u>Soil and water quality protection</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>405.2</u>	<u>Vegetation and soil protection</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>405.3</u>	<u>Native plant landscaping</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>406</u>			
<u>406</u>	<u>Building site waste management</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>407</u>			
<u>407.1</u>	<u>Walkways and bicycle paths</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>407.2</u>	<u>Changing and shower facilities</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>407.3</u>	<u>Bicycle parking and storage</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>407.4</u> ; <u>407.4.1</u>	High-occupancy vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>407.4</u> ; <u>407.4.2</u>	Low-emission, hybrid and electric vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>408</u>			
<u>408</u>	<u>Heat island mitigation</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>409</u>			
<u>409.1</u>	Light pollution control <u>Site lighting</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY			
<u>501</u>			
<u>501</u>	<u>Construction material management</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>502</u>			
<u>502.1</u> <u>503.1</u>	Minimum percentage of waste material diverted from landfills	<input type="checkbox"/> 50% <input type="checkbox"/> 65% <input type="checkbox"/> 75%	
<u>503</u>			

Section	Section Title or Description and Directives	Jurisdictional Requirements	
<u>503</u>	<u>Waste management and recycling</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>504</u>			
<u>504</u>	<u>Material selection</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>505</u>			
<u>505</u>	<u>Lamps</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>506</u>			
<u>506</u>	<u>Building Envelope moisture control</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
<u>601</u>			
<u>601.3</u>	<u>Performance-based compliance</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>601.4</u>	<u>Prescriptive-based compliance</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>602</u>			
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: zEPI: _____	
<u>603</u>			
<u>603</u>	<u>Energy metering, monitoring and reporting</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>604</u>			
<u>604.4</u>	<u>Automated demand response infrastructure</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 7. WATER RESOURCE CONSERVATION, QUALITY AND EFFICIENCY			
<u>701</u>			
Where Section 702 is selected by the jurisdiction, compliance with Section 701.7 is not required unless specifically selected by the jurisdiction.			
<u>701</u>	<u>General; fixtures, fittings, equipment and appliances</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>701.7 702.7</u>	<u>Municipal reclaimed water</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>702</u>			
<u>702</u>	<u>HVAC systems and equipment</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>703</u>			
<u>703</u>	<u>Water treatment devices and equipment</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>704</u>			
<u>704</u>	<u>Metering</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>705</u>			
<u>705</u>	<u>Nonpotable water requirements</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>706</u>			
<u>706</u>	<u>rainwater collection and distribution systems</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>707</u>			
<u>707</u>	<u>Graywater systems</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>708</u>			
<u>708</u>	<u>Reclaimed water systems</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>709</u>			
<u>709</u>	<u>Alternate onsite nonpotable water sources</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT			

Section	Section Title or Description and Directives	Jurisdictional Requirements	
<u>801</u>			
<u>801.1</u>	<u>Indoor air quality management plan required</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>802</u>			
<u>802</u>	<u>Building construction features, operations and maintenance facilitation</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>803</u>			
<u>803</u>	<u>HVAC systems</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>804</u>			
<u>804.1</u>	<u>Fireplaces and appliances</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>804.2</u>	<u>Post-construction pre-occupancy baseline IAQ testing</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>805</u>			
<u>805</u>	<u>Prohibited materials</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>806</u>			
<u>806</u>	<u>Material emissions and pollutant control</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>807</u>			
<u>807</u> <u>807.4</u>	<u>Sound transmission and sound levels Acoustics</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>808</u>			
<u>808</u>	<u>Daylighting</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 9. COMMISSIONING, OPERATION AND MAINTENANCE			
Where other selected sections of this code require compliance with Table 903.1 or where the jurisdiction selects one or more requirements from Table 903.1, compliance with sections 902 and 903 shall also be required.			
<u>Chapter 4 of Table 903.1</u>	<u>Commissioning plan</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>Chapter 5 of Table 903.1</u>	<u>Commissioning plan</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>Chapter 6 of Table 903.1</u>	<u>Commissioning plan</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>Chapter 7 of Table 903.1</u>	<u>Commissioning plan</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>Chapter 8 of Table 903.1</u>	<u>Commissioning plan</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>904</u>	<u>Building operations and maintenance</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
Where one or more sections in Chapter 10 are selected as jurisdictional requirements, projects shall also comply with Section 1001, and Section 1005 shall apply.			
<u>1002</u>			
<u>1002</u>	<u>Additions</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>1003</u>			
<u>1003</u>	<u>Alterations to existing buildings</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>1004</u>			
<u>1004</u>	<u>Change of occupancy</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>1006</u>			
<u>1006</u>	<u>Demolition</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>1007</u>			

Section	Section Title or Description and Directives	Jurisdictional Requirements	
<u>1007.1</u> 1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>1007.2</u> 1007.3	Post Certificate of Occupancy zEPI, energy demand, and CO ₂ e emissions reporting	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>Chapter 11,</u>			
<u>Where one or more sections in Chapter 11 are selected as jurisdictional requirements, projects shall also comply with Section 1101, and Section 1105 shall apply.</u>			
<u>1102</u>			
<u>1102</u>	<u>Additions</u>		
<u>1103</u>			
<u>1103</u>	<u>Alterations to existing building sites</u>		
<u>1104</u>			
<u>1104</u>	<u>Change of occupancy</u>		

302.1.1 zEPI of 46 or less. For occupancies where a zEPI of 46 or less is indicated by the jurisdiction in Table 302.1, buildings shall comply on a performance-basis in accordance with Section 601.3.1.

Exception: Buildings less than 25,000 square feet (2323 m²) in *total building floor area* pursuing compliance on a prescriptive basis shall be deemed to have a zEPI of 51 and shall not be required to comply with the zEPI of Jurisdictional Choice indicated by the jurisdiction in Table 302.1.

303.1 Whole building life cycle assessment. ~~Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a Whole building life cycle assessment shall be performed in accordance with the following:~~

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1 Primary energy use.
 - 1.2 Acidification potential.
 - 1.3 Eutrophication potential.
 - 1.4 Ozone depletion potential.
 - 1.5 Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.

7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.

8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO14044.

Delete without substitution:

~~**401.1 Scope and intent.** This chapter provides requirements for the development and maintenance of building and building sites to minimize negative environmental impacts and to protect, restore and enhance the natural features and environmental quality of the site.~~

Revise as follows:

~~**401.1**~~ **401.2 Predesign site inventory and assessment.** An inventory and assessment of the natural resources and baseline conditions of the building site shall be submitted with the construction documents. The inventory and assessment shall:

1. Determine the location of any protection areas identified in Section 402.4 that are located on, or adjacent to, the building site;
2. Determine whether, and to the degree to which, the native soils and hydrological conditions of the building site have been disturbed and altered by previous use or development;
3. Identify invasive plant species on the site for removal; and
4. Identify native plant species on the site.

Delete without substitution:

~~**402.1 Protection by area.** Where flood hazard areas, surface water bodies or wetlands, conservation areas, parklands, agricultural lands or greenfields are located on, or adjacent to, a lot, the development of the lot as a building site shall comply with the provisions of Sections 402.2 through 402.8.~~

~~**402.2 Flood hazard areas.** For locations within flood hazard areas, unless compliance with Section 402.2.1 or Section 402.2.2 is required by Table 302.1, new buildings and structures and substantial improvements shall comply with Section 402.2.3.~~

Revise as follows:

~~**402.2.1**~~ **402.1 Flood hazard area preservation, general.** Where this section is indicated to be applicable in Table 302.1, New buildings and structures, site disturbance, and development of land shall be prohibited within flood hazard areas.

~~**402.2.2**~~ **402.2 Flood hazard area preservation, specific.** Where this section is indicated to be applicable in Table 302.1, New buildings and structures, site disturbance, and development of land shall be prohibited within the specific flood hazard areas established pursuant to local land use authority.

402.2.3 402.3 Development in flood hazard areas. New buildings, structures and *substantial improvements* constructed in *flood hazard areas* shall be in compliance with Section 1612 of the *International Building Code* provided the lowest floors are elevated or dry floodproofed to not less than 1 foot (25 mm) above the elevation required by Section 1612 of the *International Building Code*, or the elevation established by the jurisdiction, whichever is higher.

402.3 402.4 Surface water protection. ~~Where this section is indicated to be applicable in Table 302.1,~~ Buildings and building site improvements shall not be located over, or located within a *buffer* as established by the jurisdiction, around or adjacent to oceans, lakes, rivers, streams and other bodies of water that support or could support fish, recreation or industrial use. The *buffer* shall be measured from the ordinary high-water mark of the body of water.

Exceptions:

1. Buildings and associated site improvements specifically related to the use of the water including, but not limited to, piers, docks, fish hatcheries, and habitat restoration facilities, shall be permitted where the impacts of the construction and location adjacent to or over the water on the habitat is mitigated.
2. Buildings and associated site improvements shall be permitted where a wetlands permit has been issued under a national wetlands permitting program or otherwise issued by the authority having jurisdiction.

402.4 402.5 Wetland protection. Buildings and building site improvements shall not be located within a wetland or within a *buffer* as established by the jurisdiction around a wetland.

Exception: Buildings and associated site improvements specifically related to the use of the wetland including, but not limited to, piers, docks, fish hatcheries, and habitat restoration facilities, shall be permitted where the impacts of the construction and location adjacent to or over the wetland on the habitat are mitigated.

402.5 402.6 Conservation area. ~~Where this section is indicated to be applicable in Table 302.1,~~ Site disturbance or development of land in or within 50 feet (15 240 mm) of any designated conservation area shall not be permitted.

Exception: Buildings and associated site improvements located in or within 50 feet (15 240 mm) of a conservation area shall be permitted where the building and associated site improvements serve a purpose related to the conservation area as determined by the authority that designated the conservation area.

402.6 402.7 Park land. Site disturbance ~~of or~~ development of land located within a public park shall not be permitted.

Exceptions:

1. Buildings and site improvements shall be permitted to be located within a park where the building and site improvements serve a park-related purpose.
2. Park lands owned and managed by the Federal government shall be exempt from this prohibition.
3. Privately held property located within the established boundary of a park shall be exempt from this prohibition.

402.7 402.8 Agricultural land. ~~Where this section is indicated to be applicable in Table 302.1,~~ Buildings and associated site improvements shall not be located on land zoned for agricultural purposes.

Exception: Buildings and associated site improvements shall be permitted to be located on agriculturally zoned land where the building serves an agriculturally related purpose, including, but not limited to, primary residence, farmhouse, migrant workers housing, farm produce storage, processing and shipping.

~~**402.8 402.9 Greenfield sites.** Where this section is indicated to be applicable in Table 302.1, Site disturbance or development shall not be permitted on *greenfield* sites.~~

Exception. (No change to text of the exception.)

Delete without substitution:

~~**406.2 Construction waste.** Construction materials and waste and hardscape materials removed during site preparation shall be managed in accordance with Section 503.~~

Revise as follows:

~~**407.4 Preferred vehicle parking.** Where either Section 407.4.1 or 407.4.2 is indicated to be applicable in Table 302.1, parking is provided at a building site, shall comply with this section.~~ Preferred parking spaces required by this section shall be those in the parking facility that are located on the shortest route of travel from the parking facility to a building entrance, but shall not take precedence over parking spaces that are required to be accessible in accordance with the *International Building Code*. Where buildings have multiple entrances with adjacent parking, parking spaces required by this section shall be dispersed and located near the entrances. Such parking spaces shall be provided with *approved* signage that specifies the permitted usage.

~~**409.1 Light pollution control.** Where this section is indicated to be applicable in Table 302.1, Uplight, light trespass, and glare shall be limited for all exterior lighting equipment as described in Sections 409.2 and 409.3.~~

Exception: Lighting used for the following exterior applications is exempt where equipped with a control device independent of the control of the nonexempt lighting:

1. Specialized signal, directional, and marker lighting associated with transportation.
2. Advertising signage or directional signage.
3. Lighting integral to equipment or instrumentation and installed by its manufacturer.
4. Theatrical purposes, including performance, stage, film production, and video production.
5. Athletic playing areas where lighting is equipped with hoods or louvers for glare control.
6. Temporary lighting.
7. Lighting for industrial production, material handling, transportation sites, and associated storage areas where lighting is equipped with hoods or louvers for glare control.
8. Theme elements in theme and amusement parks.
9. Roadway lighting required by governmental authorities.
10. Lighting used to highlight features of public monuments and registered landmark structures.
11. Lighting classified for and used in hazardous areas.
12. Lighting for swimming pools and water features.

Delete without substitution:

SECTION 501 GENERAL

~~**501.1 Scope.** The provisions of this chapter shall govern matters related to building material conservation, resource efficiency and environmental performance.~~

Revise as follows:

SECTION ~~501~~ **502** CONSTRUCTION MATERIAL MANAGEMENT

~~503.1~~ **502.1 Construction material and waste management plan.** Not less than 50 percent of Nonhazardous construction waste shall be diverted from disposal ~~except where other in accordance with the percentages are~~ indicated in Table 302.1. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Delete without substitution:

~~**601.3 Application.** Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2.~~

Revise as follows:

~~601.3.1~~ **601.3 Performance-based compliance.** Buildings designed on a performance basis shall comply with Sections 602, 608.6, 609, 610, ~~and~~ 611, and 903.

~~601.3.2~~ **601.4 Prescriptive-based compliance.** Buildings designed on a prescriptive basis shall comply with the requirements of Sections 605, 606, 607, 608, 609, 610, ~~and~~ 611 and 903.

Delete without substitution:

~~**601.4 Minimum requirements.** Buildings shall be provided with metering complying with Section 603, and commissioning complying with Section 611. Where required in accordance with Section 604.1, building shall be provided with automated demand response complying with Section 604.~~

Revise as follows:

~~**603.1 Purpose.** Buildings that consume energy shall comply with Section 603.~~ The purpose of this section is to provide requirements that will ensure that buildings are constructed or altered in a way that will provide the capability for their energy use, production and reclamation to be measured, monitored and reported. This includes the design of energy distribution systems so as to isolate load types, the installation of, or ability to install in the future meters, devices and a data acquisition system, and the installation of, or the ability to provide, public displays and other appropriate reporting mechanisms in the future.

All forms of energy delivered to the building and building site, produced on the building site or in the building and reclaimed at the building site or in the building shall be metered and all energy load types measured in accordance with this section.

604.1 Establishing an open and interoperable automated demand-response (Auto-DR) infrastructure. ~~Where this section is indicated to be applicable in Table 302.1, b~~Buildings that contain heating, ventilating, air-conditioning (HVAC) or lighting systems shall comply with Sections 604.1 through 604.4. A building energy management and control system (EMCS) shall be provided and integrated with building HVAC systems controls and lighting systems controls to receive an open and interoperable automated demand response (Auto-DR) relay or Internet signal. Building HVAC and lighting systems and specific building energy-using components shall incorporate preprogrammed demand response strategies that are automated with a demand response automation Internet software client.

Exception: Auto-DR infrastructure is not required for the following:

1. Buildings located where the electric utility or regional Independent System Operator (ISO) or Regional Transmission Operator (RTO) does not offer a demand response program to buildings regulated by this code.
2. Buildings with a peak electric demand not greater than 0.75 times that of the standard reference design.
3. Buildings that have incorporated onsite renewable energy generation to provide 20 percent or more of the building's energy demand.

Delete without substitution:

SECTION 701 GENERAL

~~**701.1 Scope.** The provisions of this chapter shall establish the means of conserving water, protecting water quality and providing for safe water consumption.~~

Revise as follows:

SECTION 701-702 FIXTURES, FITTINGS, EQUIPMENT AND APPLIANCES

~~**702.7**~~ **701.7 Municipal reclaimed water.** ~~Where required by Table 302.1 and w~~Where municipal reclaimed water is accessible and allowed for such use by the laws, rules and ordinances applicable in the jurisdiction, it shall be supplied to water closets, water-supplied urinals, water-supplied trap primers and applicable industrial uses. A municipal reclaimed water supply shall be deemed accessible where the supply is not greater than 150 percent of the distance that the potable water supply is from the lot boundary or the supply is within 100 feet (30.5 m) of a potable water supply that serves the lot.

Delete without substitution:

~~**801.1 Scope and intent.** The provisions of this chapter are intended to provide an interior environment that is conducive to the health of building occupants.~~

Revise as follows:

~~**801.2**~~ **801.1 Indoor air quality management plan required.** An indoor air quality management plan shall be developed. Such plan shall address the methods and procedures to be used during design and construction to obtain compliance with Sections 802 through 805.

804.2 Post-construction, pre-occupancy baseline IAQ testing. ~~Where this section is indicated to be applicable in Table 302.1, and~~ After all interior finishes are installed, the building shall be tested for indoor air quality and the testing results shall indicate that the levels of VOCs meet the levels detailed in Table 804.2 using testing protocols in accordance with ASTM D 6196, ASTM D 5466, ASTM D 5197, ASTM D6345, and ISO 7708. Test samples shall be taken in not less than one location in each 25,000 square feet (1860 m2) of floor area or in each contiguous floor area.

Exceptions:

1. Group F, H, S and U occupancies shall not be required to comply with this section.
2. A building shall not be required to be tested where a similarly designed and constructed building as determined by the *code official*, for the same owner or tenant, has been tested for indoor air quality and the testing results indicate that the level of VOCs meet the levels detailed in Table 804.2.
3. Where the building indoor environment does not meet the concentration limits in Table 804.2 and the tenant does not address the air quality issue by mitigation and retesting, the building shall be flushed-out by supplying continuous ventilation with all air-handling units at their maximum outdoor air rate for at least 14 days while maintaining an internal temperature of at least 60°F (15.6°C), and relative humidity not higher than 60 percent. Occupancy shall be permitted to start 7 days after start of the flush-out, provided that the flush-out continues for the full 14 days.

807.1 Sound transmission and sound levels. ~~Where required by Table 302.1,~~ Buildings and tenant spaces shall comply with the minimum sound transmission class and maximum sound level requirements of Sections 807.2 through 807.5.2.

Exception: The following buildings and spaces need not comply with this section:

1. Building or structures that have the interior environment open to the exterior environment.
2. Parking structures.
3. Concession stands and toilet facilities in Group A-4 and A-5 occupancies.

Revise as follows:

1001.3 Compliance. Alterations, repairs, additions and changes of occupancy to existing structures shall comply with ~~the those~~ provisions of this chapter identified by the jurisdiction in Table 302.1.

Exception: Where a tenant in a multi-tenant building does not have control within that tenant space of a complete system or item, compliance for that complete system or item shall not be required.

1002.1 General. Additions to any site-built building or structure shall comply with ~~the select~~ requirements of this code for new construction, as identified by the jurisdiction in Table 302.1. Any addition to a modular building that is relocated within or into a jurisdiction that is in compliance with requirements or approvals in effect at the time of its construction shall comply with Section 1002 of this code.

1003.1 General. Alterations to existing buildings and building systems shall be in accordance with ~~the select~~ provisions of this code, as identified by the jurisdiction in Table 302.1, for those assemblies, systems and components being altered. Unaltered portions, components and systems of the building, including relocated modular buildings, shall be in accordance with the provisions of the code in force at the time of their construction. Alterations shall not be made to an existing building or structure that will cause the existing building or structure to be in violation of any provisions of this code.

Delete without substitution:

1007.1 General. Sections 1007.2 and 1007.3 shall be mandatory and enforced only where specifically indicated by the jurisdiction in Table 302.1.

Revise as follows:

1007.1-1007.2 Evaluation and certification of existing buildings and building sites.

Where a permit application is accepted by a jurisdiction for the evaluation of an existing building and building site in accordance with the requirements of this code as applicable to a new project, and this code does not otherwise require compliance, evaluation shall be in accordance with the requirements of this section.

1007.1.1 1007.2.4 Certificate of compliance. Where compliance with the requirements of this code as applicable to a new building is verified by the code official for an existing building and building site, a certificate shall be issued indicating compliance to this code, as modified by the limitations contained in Sections 1007.1.2 1007.2.2 through 1007.1.3.2 1007.2.3.2.

1007.1.2 1007.2.2 Specific exclusions. Where evidence of compliance is not available, existing buildings evaluated under Section 1007.1 1007.2 shall not be subject to the requirements of Section 806 where Section 806 has been selected by the jurisdiction in Table 302.1. Where, in Table 302.1, the jurisdiction has required compliance with provisions of this code related to the project's construction phase, including Sections 401.1 404.2, 406.1, 406.2, 501 502, 502.1 503.4 and 803.1, those portions of Section 405 related to the construction phase, and other sections as *approved* by the *code official*, shall not be required for buildings evaluated under Section 1007.2. Where buildings do not comply with the aforementioned sections, the certification shall specifically list the sections for which compliance has not been required or verified.

Revise as follows:

1101.3 Compliance. Alterations and repairs to building sites shall comply with those provisions of this code identified by the jurisdiction in Table 302.1, unless provided otherwise in this chapter. Where differences occur between the provisions of this code and the provisions of other locally adopted land use, zoning or site development regulations, the provisions of the most restrictive code or regulation shall apply.

1102.1 General. Additions to any building site improvements shall comply with ~~the select~~ requirements of this code for new construction, as identified by the jurisdiction in Table 302.1. Unaltered portions of a building site shall be in accordance with the provisions of the code in force at the time of their construction. Where additions to a building, or additions to building site improvements result in the alteration of existing portions or improvements of the building site, those alterations shall comply with this section and Section 1103.

Additions to an existing building site shall be made to ensure the following:

1. Existing building site improvements together with the additional or expanded improvements are not less conforming to the provisions of this code than the existing building site was prior to the addition; and
2. Where additions to any building reduces, or requires alteration to, building site improvements, the alterations to the building site together with unaltered site improvements shall not be less conforming to the provisions of this code prior to the addition to the building or structure.

1103.1 General. Alterations to existing portions or site improvements on building sites shall be in accordance with ~~the select~~ provisions of this code, as identified by the jurisdiction in Table 302.1, for those portions or building site improvements being altered. Unaltered portions and site improvements of the building site shall be in accordance with the provisions of the code in

force at the time of their construction. Alterations shall be such that the existing building site is no less conforming to the provisions of this code than the existing building site was prior to the alteration.

Unaltered portions and site improvements of a building site shall be in accordance with the provisions of the code in force at the time of their construction or preservation.

Exception: Where, in the opinion of the *code official*, there is no significant compromise of the intent of this code, the *code official* shall have the authority to approve materials and assemblies that perform in a manner that is at least the equivalent of those being replaced.

1104.1 Conformance. Where a change in the use or occupancy of a building or tenant space places it in a different division of the same group or occupancy or in a different group of occupancies, as determined in accordance with the provisions of the *International Building Code*, compliance with Section 1104.2 shall be required. Altered portions of, and additions to, existing buildings and existing building sites that are not a result of change of occupancy requirements, shall comply with Chapter 10 and this chapter.

Exception: Historic buildings that comply with Section 1105 shall not be required to comply with Section 1104.

Reason: The intent of this proposal is to encourage adoption of the IgCC by increasing the jurisdiction's flexibility as to which and how many requirements they may choose to enforce. The basic premise of this proposal is that all code sections (excluding the project electives in the appendix) become jurisdictional requirements that are available to be selected from Table 302.1. This proposal does not modify the technical content of the requirements.

In order for the IgCC to exist, it must be adopted. ICC has provided the following link which demonstrates that only 10 states have jurisdictions who have adopted the IgCC. This suggests that perhaps the IgCC must be modified in its approach in order to become more appealing to a broader array of sustainable goals, infrastructure and capacity. <http://www.iccsafe.org/gr/Pages/adoptions.aspx>

The IgCC is set up in 3 tiers: A base code, jurisdictional requirements that the jurisdiction selects, and project electives to be selected by the applicant (if the appendix is adopted). Each tier adds an increased level of "green". This proposal turns the base code requirements into jurisdictional requirements, thereby increasing the list of options for jurisdictions to select from in Table 302.1. Chapter format and content do not change other than to tweak parts in order to reflect the conversion of all requirements to the table list. Some sections have been deleted; however, you will notice these sections are unnecessary because they are not comprised of requirements or other substantive content.

By eliminating a base set of requirements it may appear that the IgCC loses its fervor and purpose, however, this proposal may actually provide an opportunity for many more to be able to adopt small portions of this code where they may not have been able to before.

In closing: greater flexibility may increase broader adoption, which will substantiate the continued development of this tool, and provide us the opportunity to help us to increase the health of people and the communities we live in.

Cost Impact: Will not increase the cost of construction

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG74-14 : 302.1-PETRIE1168

GG75-14

302.1

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Brickfield, Burchette, Ritts and Stone (gas@bbrslaw.com); Brian Dean (Brian.Dean@icfi.com); William Prindle (william.prindle@icfi.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello (misuriello@verizon.net)

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply provided that buildings complying under ICC 700 also demonstrate compliance with the applicable codes listed in Section 102.4.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

Reason. This proposal provides important clarification and direction to code users who comply via ICC 700 and to the code officials who must determine compliance. The current language of Section 302.1(1) exempts the project from “the remainder of [the IgCC]” when ICC 700 is selected. However, that does not and should not release the project from the requirements of Chapter 1, and specifically, Section 102.4. Section 102.4 requires all projects to comply with the applicable International Codes, irrespective of the compliance path selected. The proposed language makes it clear that the choice of ICC 700 as the compliance path does not exempt buildings from compliance with the rest of the applicable I-codes.

The IgCC should be written to promote utilization of the other I-codes regardless of the compliance path or alternative. To maintain the effectiveness and credibility of the IgCC, great care should be taken not to create loopholes or exceptions that would appear to exempt code users from complying with the fundamental building requirements contained in the International Codes.

Cost Impact: Will not increase the cost of construction

GG75-14 : 302.1-STONE906

GG76-14

202, 302.1, Table 302.1, 302.1.1, 601.3, 602.1, 602.1.1, 602.1.2, 602.1.2.1, Table 602.1.2.1, 602.1.2.2, Table 602.1.2.2, 602.1.2.3, 602.1.3, 602.2, 602.2.1, Table 602.2.1, 602.2.2, Table 602.2.2, 602.2.3, Table A106

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas NV, representing ICC Sustainability, Energy & High Performance Code Action Committee

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2. Where indicated in Table 302.1, buildings shall comply with Section 601.3.1.

602.1 Performance-based compliance. Compliance for buildings and their sites to be designed on a performance basis shall be determined by predictive modeling in accordance with this section. ~~Predictive modeling shall use source energy kBtu/sf y unit measure based on compliance with Section 602.1.1 and CO₂e emissions in Section 602.3. Where a building has mixed uses, all uses shall be included in the performance-based compliance.~~

602.1.2.2 Electric power. ~~In calculating the annual energy use index, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.~~

**TABLE ~~602.1.2.2~~ 602.2.2(2)
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE^a**

(Portions of table not shown remain unchanged.)

602.1.2.3 Nonrenewable energy. ~~In calculating the annual energy use index for fuel other than electrical power, energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2. The conversion factor for energy sources not included in Table 602.1.2.2 shall be 1.1. Conversion factors for purchased district heating shall be 1.35 for hot water and 1.45 for steam. The conversion factor for district cooling shall be 0.33 times the value in Table 602.1.2.1 based on the EPA eGRID Sub- region in which the building is located.~~

602.1.1 602.2 zEPI-Performance modeling. Performance-based designs shall demonstrate an EUIp that complies with Equation 6-1. ~~Where indicated in Table 302.1, the proposed design shall further reduce annual energy use by not less than the amount indicated in Table 302.1 as compared to the energy used by the standard reference design. a zEPI of not more than 51 as determined in accordance with Equation 6-1 for energy use reduction and shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.~~

$$zEPI = 57 \times (EUIp/EUI) \quad EUIp < 90\% \times EUIb \quad \text{(Equation 6-1)}$$

where:

EUI_p = the proposed energy use index in source kBtu/sf-y for the proposed design of the building and its site calculated in accordance with Section ~~602.1.2~~ 602.2.1.

~~EUI~~ EUI_b = the base annual energy use index in source kBtu/sf-y for a baseline building and its site calculated in accordance with Section ~~602.1.2~~ 602.2.1.

~~602.1.2~~ 602.2.1 **Base annual energy use index.** The proposed energy use index (EUI_p) of the building and building site and the base annual energy use index (EUI_b) shall be calculated in accordance with ~~Equation 6-1 and Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through 602.1.2.3~~ 602.2.2. The annual energy use shall include all energy used for building functions and its anticipated occupancy.

~~602.1.2.1~~ **Modifications to Appendix G of ASHRAE 90.1.** 602.2.2 **Source energy.** The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on source energy use converted to consistent units in accordance with ~~this section~~ Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.

Electric energy shall be converted to kBtus and multiplied by the source energy conversion factor in Table 602.2.2(1) based on the geographical location of the building. The source energy conversion factor for electricity generated by an on-site renewable energy system shall be 1.00. Fossil fuel energy shall be converted to kBtus and multiplied by the source energy conversion factors in Table 602.2.2(2). District cooling energy shall be converted to kBtu's, multiplied by 0.33, and then multiplied by the source energy conversion factor in Table 602.2.2(1) based on the geographical location of the building. District heating shall be converted to kBtus and multiplied by 1.35 for hot water and 1.45 for steam. All other energy shall be converted to kBtus and multiplied by 1.1.

**TABLE ~~602.1.2.1~~ 602.2.2(1)
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

(Portions of table not shown remain unchanged.)

~~602.1.3~~ 602.2.3 **Registered design professional in responsible charge of building energy simulation.** For purposes of this section, and where it is required that documents be prepared by a *registered design professional*, the *code official* is authorized to require the owner to engage and designate on the building permit application a *registered design professional* who shall act as the registered design professional in responsible charge of building energy simulation. Modelers engaged by the registered design professional in responsible charge of building energy simulation shall be certified by an *approved* accrediting entity. Where the circumstances require, the owner shall designate a substitute registered design professional in responsible charge of building energy simulation who shall perform the duties required of the original registered design professional in responsible charge of building energy simulation. The *code official* shall be notified in writing by the owner whenever the registered design professional in responsible charge of building energy simulation is changed or is unable to continue to perform the duties.

~~602.2.3~~ **Annual direct and indirect CO₂e emissions associated with onsite use of fossil fuels and purchased district energy.** Emissions associated with the use of natural gas, fuel oil and, propane shall be calculated by multiplying the natural gas, fuel oil, and propane delivered to the building at the utility meter by the corresponding emission factors in Table 602.2.2. Emissions associated with fossil fuels not listed shall be calculated by multiplying the fossil fuel delivered to the building at the utility meter by 250. Emissions associated with purchased district heating shall be calculated by multiplying the heating energy delivered to the building at the utility meter by 150 for hot water and steam, and for district cooling, the factors from Table ~~602.2.1~~ based on the EPA eGRID Sub-region in which the building is located.

~~602.2~~ 602.3 **Annual direct and indirect CO₂e emissions.** The CO₂e emissions calculations for the building and building site shall be determined in accordance with Sections 602.2.1 and 602.2.2. The

emissions associated with the proposed design shall be less than or equal to the CO₂e emissions associated with the standard reference design in accordance with Equation 6-2.

$$\text{CO}_2e_{pd} \geq (\text{zEPI} \times \text{CO}_2e_{srbd})/57 \quad \text{(Equation 6-2)}$$

where:

zEPI = the minimum score in accordance with Section 602.1.1.

CO₂e_{pd} = emissions associated with the proposed design.

CO₂e_{srbd} = emissions associated with the standard reference budget design in accordance with Section 602.1.2.

~~602.2.1~~ **602.3.1 Onsite electricity.** Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWHs, and multiplying by the CO₂e conversion factor in Table ~~602.3.1~~ **602.2.4** based on the EPA eGRID Sub-region in which the building is located.

**TABLE ~~602.2.1~~ 602.3.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

(Portions of table not shown remain unchanged.)

~~602.2.2~~ **602.3.2 Onsite nonrenewable energy.** Emissions associated with the use of nonrenewable energy sources other than electrical power such as natural gas, fuel oil, and propane shall be calculated by multiplying the nonrenewable energy fossil fuel energy used by the building and its site at the utility meter by the national emission factors in Table ~~602.2.2~~ **602.3.2** and the conversions required by this section. Emissions associated with fossil fuels not specified in Table ~~602.2.2~~ **602.3.2** shall be calculated by multiplying the fossil fuel used by the building at the utility meter by 250. Emissions associated with purchased district energy shall be calculated by multiplying the energy used by the building at the utility meter by 150 for hot water and steam, and for district cooling. Emissions associated with purchased district cooling shall be calculated by multiplying the factors from Table 602.2.2 based on the EPA eGRID Sub-region in which the building is located.

**TABLE ~~602.2.2~~ 602.3.2
FOSSIL FUEL EMISSION FACTORS**

(Portions of table not shown remain unchanged.)

Delete without substitution:

SECTION 202 DEFINITIONS

~~**ZERO ENERGY PERFORMANCE INDEX (zEPI).** A scalar representing the ratio of energy performance of the proposed design compared to the average energy performance of buildings relative to a benchmark year.~~

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.

2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less required minimum reduction in annual energy use in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION		
302.1, 302.1.1, 602.2 602.4	zEPI of Jurisdictional Choice — The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require Enhanced energy performance. Where the jurisdiction intends to require enhance energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a required minimum reduction in annual energy use for such buildings of not less than 5 percent, as calculated in accordance with Section 602.2.	Occupancy: _____ zEPI: _____ Minimum reduction in energy use %
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes <input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

302.1.1 zEPI of 46 or less Enhanced energy performance. Where enhanced energy performance a zEPI of 46 or less is indicated by the jurisdiction in Table 302.1, buildings shall comply on a performance-basis in accordance with Section 601.3.1.

Exception: Buildings less than 25,000 square feet (2323 m²) in *total building floor area* pursuing compliance on a prescriptive basis in accordance with Section 601.3.2 shall be deemed to have a zEPI of 51 and shall not be required to comply with the zEPI of Jurisdictional Choice indicated by the jurisdiction in Table 302.1.

Revise as follows:

**TABLE A106
ENERGY CONSERVATION AND EFFICIENCY**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 10 to establish the minimum total number of project electives that must be satisfied.	—
A106.1	zEPI reduction project electives	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	Project zEPI is at least 5 points performance is at least 3% lower than required by Table 302.1	1 elective
A106.1	Project zEPI is at least 10 points performance is at least 6% lower than required by Table 302.1	2 electives

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A106.1	Project zEPI is at least 15 points performance is at least 9% lower than required by Table 302.1	3 electives
A106.1	Project zEPI is at least 20 points performance is at least 12% lower than required by Table 302.1	4 electives
A106.1	Project zEPI is at least 25 points performance is at least 15% lower than required by Table 302.1	5 electives
A106.1	Project zEPI is at least 30 points performance is at least 18% lower than required by Table 302.1	6 electives
A106.1	Project zEPI is at least 35 points performance is at least 21% lower than required by Table 302.1	7 electives
A106.1	Project zEPI is at least 40 points performance is at least 24% lower than required by Table 302.1	8 electives
A106.1	Project zEPI is at least 45 points performance is at least 27% lower than required by Table 302.1	9 electives
A106.1	Project zEPI is at least 51 points performance is at least 31% lower than required by Table 302.1	10 electives
A106.2	Mechanical systems project elective	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.3	Service water heating	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.4	Lighting systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.5	Passive design	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—5 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—10 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—20 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The modeling path for demonstrating compliance with energy provisions in the IgCC provides design flexibility for projects meeting this code. The reference to ASHRAE 90.1 Appendix G was used in the first IgCC, and is the most widely used set of modeling rules for high performance buildings. This proposal considerably shortens Section 602 and simplifies the modeling requirements that were adopted in the 2012 IgCC and it removes the zEPI calculation step and reserves it for a proposed outcome-based compliance path. In addition, the proposal maintains the compromise source calculation that was developed and adopted in the 2012 IgCC code cycle.

Language has been added to give greater clarity as to how Chapter 6, and specifically Section 602, interacts with the jurisdictional electives for Enhanced Energy Performance in Section 302.

Cost Impact: Will not increase the cost of construction.

GG76-14: 302.1-THOMPSON940

GG77-14
302.1, 408.3

Proponent: Jay Crandell, ARES Consulting, representing EPDM Roofing Association
(jcrandell@aresconsulting.biz)

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 4. SITE DEVELOPMENT AND LAND USE			
402.2.1	Flood hazard area preservation, general	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.2.2	Flood hazard area preservation, specific	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.3	Surface water protection	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
402.5	Conservation area	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.7	Agricultural land	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
402.8	Greenfield sites	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.1	High-occupancy vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.2	Low-emission, hybrid and electric vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>408.3</u>	<u>Roof coverings -- solar reflectance and thermal emittance</u>	<input type="checkbox"/> <u>Yes</u>	<input type="checkbox"/> <u>No</u>
409.1	Light pollution control	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged)

408.3 Roof surfaces. Where required by Table 302.1, not less than 75 percent of the roof surfaces of buildings and covered parking located in climate zones 1 through 3, as established in the *International Energy Conservation Code*, shall be a roof complying with Section 408.3.1; shall be covered with a vegetative roof complying with Section 408.3.2; or a combination of these requirements. The provisions of this section shall apply to roofs of structures providing shade to parking in accordance with Section 408.2.2 where located in climate zones 1 through 6.

Exception: Portions of roof surfaces occupied by the following shall be permitted to be deducted from the roof surface area required to comply with this section:

1. Solar thermal collectors.
2. Solar photovoltaic systems.
3. Roof penetrations and associated equipment.
4. Portions of the roof used to capture heat for building energy technologies.
5. Rooftop decks and rooftop walkways.

Reason: The urban heat island effect is an urban or “large metropolitan area” issue. It is not an issue that should categorically affect all cities, towns, counties, etc. within a given climate zone. The heat island effect is more appropriately understood as a matter of building population density. It is also potentially a matter of the mix of types of construction or building occupancy within a given urban setting since some of the building types composing the largest collective roof areas are generally exempted (e.g., most residential buildings). Therefore, there may be cities, townships, zip codes, or whole counties where building and population density is so low and will remain so for such a time that requiring reflective roof surfaces over the life of select buildings will have a negligible effect. Thus, the need for such provisions is best assessed on a city-by-city, town-by-town, and county-by-county basis rather than mandated unilaterally for the entire range of development conditions within a given climate zone or political jurisdiction. This approach will better ensure value decisions are made at the local level and help ensure that the intended value is realized where it’s needed.

Cost Impact: Will not increase the cost of construction

GG77-14 : TABLE 302.1-CRANDELL363

GG78-14

302.1, 605.1.1

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Gregory Johnson, Greg Johnson Consulting, representing Coalition for Fair Energy Codes (gjohnsonconsulting@gmail.com)

Revise as follows:

605.1.1 Insulation and fenestration criteria. Where required by Table 302.1, the building thermal envelope shall exceed the requirements of Tables C402.1.2 and C402.3 of the *International Energy Conservation Code* by not less than 10 percent. Specifically, for purposes of compliance with this code, each U-factor, C-factor, F-factor and SHGC in the specified tables shall be reduced by 10 percent to determine the prescriptive criteria for this code. In Sky Type “C” locations specified in Section 808.4, the skylights shall not exceed 5 percent of the building roof area.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: zEPI:	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	No
605.1.1	10% thermal envelope stringency increase	<input type="checkbox"/> Yes	No

(Portions of Table not shown remain unchanged)

Reason: Unlike other International codes, the provisions of the IECC are not scoped as minimum standards. This is verified through a simple check of the Section C101.3 intent provisions of the IECC where no reference to minimum requirements is made. Indeed, each cycle of the development of the IECC since the 2006 edition has sharply increased the stringency of the code.

The increased envelope stringency of the code has not come without policy costs and adoption delays. Other than the administrative provisions, no other requirements of the IECC are so frequently amended than the envelope provisions; very rarely are they made more restrictive.

Lagging adoptions of the 2012 IECC and its envelope provisions provide real world proof that the IECC, in the view of local jurisdictions, exceeds minimum standards. If it was a minimum standard the IECC would more likely be adopted in a timely fashion without the wide-spread amendments to its envelope provisions.

By automatically requiring a 10% increase in stringency over the 2015 IECC's envelope provisions, which are more stringent than those of the 2012 envelope provisions, the IGCC positions itself to be even less likely to be adopted. This does a disservice to the other important energy and environmental issues addressed by the code. It energizes more public resistance to the idea of green building regulation.

This proposal allows the local jurisdiction to assess the local public will for the increased inputs associated with sharply increased envelope provisions.

Where a jurisdiction is comfortable proposing the 10% increase in envelope stringency and its associated impacts it merely has to check the appropriate box. Where that increase jeopardizes the adoption and use of the IgCC the jurisdiction can select the other box.

Cost Impact: Will not increase the cost of construction

GG78-14 : TABLE 302.1-JOHNSON107

GG79-14

202 (New), 302.1, 407.4.3 (New)

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Add new definition as follows:

SECTION 202 DEFINITIONS

ALTERNATIVE FUEL VEHICLE. A dedicated, flexible fuel, or dual-fuel vehicle designed to operate on at least one alternative fuel, such as biodiesel (B100), natural gas and liquid fuels domestically produced from natural gas, propane (liquefied petroleum gas), electricity, hydrogen, blends of 85 percent or more of methanol, denatured ethanol, other alcohols with gasoline or other fuels, coal-derived and domestically produced liquid fuels, fuels (other than alcohol) derived from biological materials, and P-Series fuels.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 4. SITE DEVELOPMENT AND LAND USE			
402.2.1	Flood hazard area preservation, general	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.2.2	Flood hazard area preservation, specific	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.3	Surface water protection	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.5	Conservation area	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.7	Agricultural land	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.8	Greenfield sites	<input type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.1	High-occupancy vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.2	Low-emission, hybrid and electric vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No

407.4.3	<u>Recharging / Refueling Station(s) for Alternative Fuel Vehicles</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
409.1	Light pollution control	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged)

Add new text as follows:

407.4.3 Alternative fuel vehicle refueling or recharging station. Where required by Table 302.1 and parking is provided for a building that has a *total building floor area of more than 10,000 square feet (929 m)* and that has an *building occupant load greater than 100*, at least one refueling or recharging station that can provide alternative fuel to not less than two *alternative fuel vehicles* shall be installed.

Reason: By adding a new option 407.4.3 for refueling / recharging stations to be provided for alternatively fueled vehicles, there will be more flexibility for building owners and more options for building occupants and/or guests that drive alternatively fueled vehicles.

Many buildings are already providing recharging or refueling stations to occupants as a "green" benefit. As shown in other parts of the code text, it is up to the authority having jurisdiction as to whether this would be a requirement, in addition to HOV parking or low emission hybrid, and electric vehicle parking.

The new definition ALTERNATIVEFUEL VEHICLE, along with these proposed changes, will improve the standard and allow for more options by the building owners and designers.

The definition was created by the US government as part of the Energy Policy Act of 1992 (EPACT 1992). It can be located at the following US Department of Energy web site: <http://www.afdc.energy.gov/glossary.html>

The use of alternative fueled vehicles has been increasing dramatically over the past several years, as indicated by the fact that there are now over 150,000 plug-in electric vehicles (plug-in hybrids or all-electric) being driven on US roads today.

In addition, as shown in the *Wall Street Journal* article of November 5, 2013 entitled "More Commuters Go It Alone", the percentage of American workers age 16 and over who drive alone to work has increased from 64.4% in 1980 to 76.3% in 2012. Provisions in this code that encourage the use of such vehicles will have significant national benefits.

Cost Impact: Will increase the cost of construction

GG79-14 : TABLE 302.1-ROSENSTOCK492

GG80-14

303, 303.1, 505.1, 505.1.1(NEW)

Proponent: David Collins, Preview Group, representing The American Institute of Architects (dcollins@preview-group.com)

Delete without substitution:

~~SECTION 303 WHOLE BUILDING LIFE CYCLE ASSESSMENT~~

Revise as follows:

505.1 Material selection and properties. Building materials shall conform to Section 505.2.

Exceptions:

1. Electrical, mechanical, plumbing, security and fire detection, and alarm equipment and controls, automatic fire sprinkler systems, elevators and conveying systems shall not be required to comply with Section 505.2.
2. Where a whole building life cycle assessment is performed in accordance with Section ~~303.1~~505.1.1, compliance with Section 505.2 shall not be required.

Revise as follows:

~~303.1~~505.1.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration,

and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.

8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Reason: This change adds new section "505.1.1 Whole building life cycle assessment". Currently the LCA requirement is in section 303 and for clarity should be moved to the Chapter 5.

Cost Impact: Will not increase the cost of construction.

Analysis: The intent of the proposal is to move Section 303 to Section 505.1.

GG80-14 : 505.1.1 (NEW)-COLLINS394

GG81-14

303, 303.1

Proponent: Hope Medina, representing Cherry Hills Village
(hmedina@coloradocode.net); Craig Conner (craig.conner@mac.com)

Delete without substitution:

SECTION 303

~~WHOLE BUILDING LIFE CYCLE ASSESSMENT~~

Reason: This section is vaguely defined, and lacks a minimum or a base case to compare the report to. The requirements or consequences do not go beyond preparing a complex report that has nothing to compare to. A whole building life cycle assessment is impractical. How is the end user going to demonstrate that the project has a 20% improvement in environmental performance for global warming potential?

The standard that has been referenced, ISO 14044 states in its Section 1 (Scope) "This International Standard is not intended for contractual or regulatory purposes or registration and certification." A building code is a regulation.

Cost Impact: Will not increase the cost of construction

GG81-14 : 303-MEDINA1146

GG82-14

303.1

Proponent: Paul Coats, American Wood Council, representing American Wood Council
(pcoats@awc.org)

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.
2. ~~The reference and project buildings shall utilize the same life cycle assessment tool.~~
32. The life cycle assessment tool shall be *approved* by the *code official*.
43. ~~Building operational energy shall be included.~~ For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. ~~Building process loads shall be permitted to be included.~~
64. ~~Maintenance and replacement schedules and actions for components shall be included in the assessment.~~ For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. ~~The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.~~

~~**Exception:** Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.~~
8. ~~The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.~~
95. The life cycle assessment shall conform to the requirements of ISO 14044/ASTM E2921.

Add new standard(s) as follows:

ASTM

ASTM E2921-13 Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems

Reason: Life Cycle Assessment, or LCA, involves assessing the various potential environmental impacts associated with using particular products or materials. This practice provides criteria to be applied irrespective of the assessment

(LCA) tool that is used when LCA is undertaken at the whole building level to compare a final whole building design to a reference building design.

The purpose of the new ASTM standard is to support the use of whole building Life Cycle Assessment (LCA) in this code by ensuring that comparative assessments of final whole building designs, relative to reference building designs, take account of the relevant building features, life cycle stages, and related activities in similar fashion for both the reference and final building designs of the same building.

The criteria do not deal with building occupant behavior, possible future changes in building function, building rehabilitation or retrofit, or other matters that cannot be foreseen or reasonably estimated at the design and/or permitting stage where this standard applies.

It is intended to provide an adequate framework which will ensure, as stated above, that any LCA is done in similar fashion and the output of the process is comparative, giving relative meaning to the results.

Whole building life cycle assessment is an alternative compliance path to the prescriptive material requirements in Chapter 5. Used in this manner, building operational energy should not be varied to achieve compliance. For this purpose, operational energy should be held constant as regulated by Chapter 6.

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standards proposed for inclusion in the code, ASTM D2921-13 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG82-14 : 303.1-COATS732

GG83-14

303.1, 505.1, 505.3(New)

Proponent: Matthew Dobson, Vinyl Siding Institute, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

505.1 Material selection and properties. Building materials shall conform to Section 505.2 or Section 505.3

Exceptions:

1. Electrical, mechanical, plumbing, security and fire detection, and alarm equipment and controls, automatic fire sprinkler systems, elevators and conveying systems shall not be required to comply with Section 505.2.
2. ~~Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505.2 shall not be required.~~

Revise as follows:

~~**303.1-505.3 Whole building life cycle assessment.** Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required.~~
The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be

assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.

9. The life cycle assessment shall conform to the requirements of ISO 14044.

Reason: This change simply moves a material evaluation/requirement to the appropriate section of the code, Section 505 Material Selection. This change will offer options that already exist but makes the code flow more efficiently.

Cost Impact: Will not increase the cost of construction

GG83-14 : 303.1-DOBSON891

GG84-14

303.1

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing SEHPCAC

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The life cycle assessment shall conform to the requirements of ASTM E2921 and ISO 14044. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.

8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. ~~The life cycle assessment shall conform to the requirements of ISO 14044.~~

Add new standard(s) as follows:

ASTM

E2921-13 Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Ratings Systems

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Life Cycle Assessment, or LCA, involves assessing the various environmental impacts associated with using particular products or materials. ASTM E2921 was created with the specific intent that it be referenced in building codes. This standard provides criteria to be applied irrespective of the assessment (LCA) tool that is used when LCA is undertaken at the whole building level to compare a final whole building design to a reference building design.

The purpose ASTM E2921 is to support the use of whole building Life Cycle Assessment (LCA) in this code by ensuring that comparative assessments of final whole building designs relative to reference building designs take account of the relevant building features, life cycle stages, and related aspects in similar fashion for both the reference and final building designs of the same building.

The criteria do not deal with building occupant behavior, possible future changes in building function, building rehabilitation or retrofit, or other matters that cannot be foreseen or reasonably estimated at the design and/or permitting stage where this Practice applies.

The proposal is intended to provide an adequate framework that will ensure, as stated above, that any LCA is done in similar fashion and the output of the process is comparative, giving relative meaning to the results.

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2921-13, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG84-14 : 303.1 #1-THOMPSON361

GG85-14

303.1

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC)

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The life cycle assessment shall conform to the requirements of ASTM E2921. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.

~~2. The reference and project buildings shall utilize the same life cycle assessment tool.~~

~~23. The life cycle assessment tool shall be *approved* by the code official.~~

~~34. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.~~

~~5. Building process loads shall be permitted to be included.~~

~~46. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.~~

~~7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.~~

~~**Exception:** Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.~~

~~8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.~~

~~9. The life cycle assessment shall conform to the requirements of ISO 14044.~~

Add new standard(s) as follows:

ASTM

E2921-13 Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems.

Reason: The ASTM practice regarding whole building Life Cycle Assessment (LCA) provides criteria to be applied irrespective of the LCA tool that is used to compare a final whole building design to a reference building design. The criteria cover many of the 303.1 sub-clauses and those clauses could therefore be deleted from 303.1 if the ASTM practice is included as previously proposed. The affected clauses are identified above with strike through, followed in each case by identification of the relevant clause in the ASTM E2921.

The proposal as shown below contains references to the ASTM section numbers which contain the information that is being deleted from Section 303.1:

303.1 Whole Building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. (No change)
2. ~~The reference and project buildings shall utilize the same life cycle assessment tool.~~ **Required by ASTM Practice clause 6.4.2**
3. ~~2.~~ The life cycle assessment tool shall be *approved* by the code *official*.
4. ~~3.~~ Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. ~~Building process loads shall be permitted to be included.~~ **ASTM 6.2.3**
6. ~~4.~~ ~~Maintenance and replacement schedules and actions for components shall be included in the assessment.~~ **ASTM 6.2.1** For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. ~~The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.~~ **ASTM 6.2.1**
- EXCEPTION:** Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment. **ASTM 6.3.3**
8. ~~The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.~~ **ASTM 6.3.1 and 6.3.4**
9. ~~The life cycle assessment shall conform to the requirements of ISO 14044.~~ **ASTM 4.1**

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2921-13 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG85-14 : 303.1 #2-THOMPSON362

GG86-14

303.1

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing SEHPCAC

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.

8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.
10. The reference service life of the reference building shall be not less than 60 years.

Reason: When the service life provisions were deleted from the body of the IgCC for the 2012 edition, it left the life cycle assessment provisions of Section 303.1 subject to major gaming. This proposal closes that gap by adding Item 10, which requires a design service life of not less than 60 years be used in the assessment. 60 years is generally accepted as a minimum for whole building life cycle assessment purposes. The proposed language was modified from the language that appeared in IgCC Public Version 2.0. Public Version 2.0 required that building service life be in

accordance with the service life provisions of former Section 505. That section required a minimum service life of 60 years, except where a building service life of 25 years was justified by community development plans and was approved by the code official. The minimum 60 year service life is also used in ASTM WK28938 (E2921), a new standard that is intended to be referenced in green and sustainable building codes and standards. Note that a minimum 60 year service life does not prohibit the use of a 75 year service life, which is used in ASHRAE 189.1.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG86-14 : 303.1 #3-THOMPSON301

GG87-14

303.1

Proponent: Mike Fischer, Kellen Company, representing Center for the Polyurethanes Industry (mfischer@kellencompany.com)

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. ~~Building operational energy shall be included.~~ The life cycle assessment shall include all regulated loads throughout the building operations life cycle stage. Building energy performance shall be determined in accordance with Appendix G of ASHRAE 90.1. Primary energy use savings and emissions avoidance for the project and reference designs shall be determined in accordance with ASHRAE 105. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Add new standard(s) as follows:

ASHRAE

105-2014 Standard Methods of Determining, Expressing and Comparing Buildings Energy Performance and Greenhouse Gas Emissions

Reason: The IgCC contains reference for building energy use and primary energy use savings without clear direction on how to determine the project versus reference designs. By linking the required valuation to the appropriate ASHRAE standards the IgCC will be able to provide a clear and consistent path to a proper evaluation of energy performance. Energy efficiency is one of most critical paths to sustainability; it is important that this component of sustainable construction be properly captured and appropriately evaluated. Appendix G of ASHRAE 90.1 is referenced in Chapter 6 for the determination of building energy use; including the standard in Chapter 3 ensures a consistent method. ASHRAE 105 is an appropriate means by which to determine primary energy savings and emissions reductions, via conversion factors from site energy to primary energy, and provides guidance on how to determine global warming potential.

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE 105, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG87-14 : 303.1 #1-FISCHER714

GG88-14

303.1, 303.1.1 (New), 303.1.1.1 (New), 303.1.2 (New), 303.1.2.1 (New)

Proponent: Mike Fischer, The Kellen Company, representing The Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

Delete and substitute as follows:

303.1 Whole building life cycle assessment. ~~Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following: Compliance with Section 505 shall not be required where a whole building life cycle assessment is performed in accordance with this Section, using an *approved* life cycle assessment tool.~~

- ~~1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building. The reference and project buildings shall utilize the same life cycle assessment tool.
 - ~~1.1. Primary energy use.~~
 - ~~1.2. Acidification potential.~~
 - ~~1.3. Eutrophication potential.~~
 - ~~1.4. Ozone depletion potential.~~
 - ~~1.5. Smog potential.~~~~
- ~~2. The reference and project buildings shall utilize the same life cycle assessment tool.~~
- ~~3. The life cycle assessment tool shall be *approved* by the *code official*.~~
- ~~4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.~~
- ~~5. Building process loads shall be permitted to be included.~~
- ~~6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.~~
- ~~7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.~~
- ~~8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.~~
- ~~9. The life cycle assessment shall conform to the requirements of ISO 14044.~~

Add new text as follows:

303.1.1 Environmental performance. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for

global warming potential and at least two of the impact measures listed in Section 303.1.1.1, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the International Building Code.

303.1.1.1 Environmental impact measures. Environmental impact measures utilized in the assessment in Section 303.1.1 shall be selected from the following:

1. Primary energy use
2. Acidification potential.
3. Eutrophication potential.
4. Ozone depletion potential.
5. Smog potential.

303.1.2 Life cycle assessment tool. The life cycle assessment shall conform to the requirements of ISO 14044. The reference and project buildings shall utilize the same life cycle assessment tool. The assessment shall be permitted to consider building process loads, and shall include the following elements:

1. Building operational energy.
2. Maintenance and replacement schedules and actions for components.
3. A full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
4. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool

303.1.2.1 Relocatable buildings. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building. The assessment shall include average transportation energy, material and waste generation associated with reuse of relocatable buildings. The average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.

Reason: The current requirements for a whole building assessment are not clearly organized. While recognizing there will be other proposals to modify the technical requirements in this section, this proposal is intended to improve the clarity of the requirements and simplify the interpretation of the code, without making any technical changes. The proposal reorganizes the provisions for the LCA tool, better outlines what elements are to be included, and combines the requirements for relocatable buildings into a separate section to improve code compliance.

Cost Impact: Will not increase the cost of construction

GG88-14 : 303.1 #2-FISCHER1117

GG89-14

303.1

Proponent: Jonathan Humble, AIA, NCARB, LEED AP-BD&C American Iron and Steel Institute, representing the American Iron and Steel Institute (jhumble@steel.org)

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1 Primary energy use.
 - 1.2 Acidification potential.
 - 1.3 Eutrophication potential.
 - 1.4 Ozone depletion potential.
 - 1.5 Smog potential.
 - 1.6 Resource use, elements and fossil.
 - 1.7 Land use, including habitat alteration.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Reason: The current LCA provisions lack the basic categories for a complete assessment in order for these provisions to be called "whole building life cycle assessment". In this case, we are proposing that two additional categories be added in order for the LCA provisions to be more complete and consistent with the ISO 14040-series standards and the whole building LCA components of ASHRAE 189.1.

According to ISO 14044, Section 4.4.2.2, "The selection of impact categories shall reflect a comprehensive set of environmental issues related to the product system being studied, taking the goal and scope into consideration." Omitting land use, a main driver of biodiversity loss, and resource depletion, an important indicator of scarcity, does not fulfill the intent of the ISO standards for LCA. Further, ISO 14044, Section 4.4.2.2.1 references land use and the definition of impact categories as needed to conduct a complete environmental assessment:

"...LCI results other than mass and energy flow data included in an LCA (e.g. land use) shall be identified and their relationship to corresponding category indicators shall be determined. For most LCA studies, existing impact categories, category indicators or characterization models will be selected. However, in some cases existing impact categories, category indicators or characterization models are not sufficient to fulfill the defined goal and scope of the LCA, and new ones have to be defined..."

In view of the above we recommend that the two new categories be added in order to be consistent with the intent of LCA assessments.

Bibliography:

ISO, "14044 - Environmental management — Life cycle assessment — Requirements and guidelines, The International Organization for Standardization", Switzerland, 2006.

Cost Impact: Will increase the cost of construction

GG89-14: 303.1 #1-HUMBLE717

GG90-14

303.1

Proponent: Jonathan Humble, AIA, NCARB, LEED AP-BD&C American Iron and Steel Institute, representing the American Iron and Steel Institute (jhumble@steel.org); Larry Williams, representing the Steel Framing Industry Association (Williams@steel framing association.org)

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1 Primary energy use.
 - 1.2 Acidification potential.
 - 1.3 Eutrophication potential.
 - 1.4 Ozone depletion potential.
 - 1.5 Smog potential.
- ~~2. The reference and project buildings shall utilize the same life cycle assessment tool.~~
- ~~3. The life cycle assessment tool shall be approved by the code official.~~
24. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
35. Building process loads shall be permitted to be included.
46. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
57. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
68. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
79. The life cycle assessment shall conform to the requirements of ISO 14044.

Reason:

(Humble) The inclusion of undefined "tools" where no criteria is included is vague and will result in inconsistent enforcement. The building official will be faced with deciding between conflicting LCA results depending on which tool is selected, and without any guidance as to how to evaluate the tools. In addition, it is doubtful that any "tool" by itself can meet the requirements of ISO standards that require critical review and an iterative process to assess the data.

Only a full LCA in compliance with the ISO standards is sufficient. There are software tools that can assist an LCA practitioner, but none that are appropriate to be included in a building code to demonstrate full compliance with ISO standards. The language in the code already requires compliance with ISO14044.

Deleting items 2 and 3 of this section will clarify what is required and reduce or eliminate the potential for conflicting results. Further, Section 105 "Approvals" remains an option for the building official to enforce at any time and for any subsequent section, therefore we question the need to duplicate what is already clearly defined in Section 105.

(Williams) The inclusion of undefined "tools" for which no criteria is included is vague and will result in inconsistent enforcement. The building official will be faced with deciding between conflicting LCA results depending on which tool is selected, and without any guidance as to how to evaluate the tools.

In addition, it is doubtful that any "tool" by itself can meet the requirements of ISO standards that require critical review and an iterative process to assess the data. Only a full LCA in compliance with the ISO standards is sufficient. There are software tools that can assist an LCA practitioner, but none that are appropriate by themselves to demonstrate full compliance with ISO standards.

The language in the code already requires compliance with ISO14044. Deleting items 2 and 3 of this section will clarify what is required and reduce or eliminate the potential for conflicting results.

Cost Impact: Will not increase the cost of construction

GG90-14 : 303.1 #2-HUMBLE718

GG91-14

303.1

Proponent: Jonathan Humble, AIA, NCARB, LEED AP-BD&C American Iron and Steel Institute, representing the American Iron and Steel Institute (jhumble@steel.org)

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1 Primary energy use.
 - 1.2 Acidification potential.
 - 1.3 Eutrophication potential.
 - 1.4 Ozone depletion potential.
 - 1.5 Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

~~**Exception:** Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.~~
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Reason: This broad exception includes items that may have a substantive impact on the LCA results. We feel that it is time for those materials to make their debut into the LCA analysis as a result of progress with green and sustainable programs and standards in the market today which include all building components.

According to ISO 14044, Section 4.2.3.3.1, "The deletion of life cycle stages, processes, inputs or outputs are only permitted if it does not significantly change the overall conclusions of the study. Any decisions to omit life cycle stages, processes, inputs or outputs shall be clearly stated, and the reasons and implications for their omission shall be explained."

Decisions regarding cut-off criteria must be made in accordance with the requirements of ISO 14044, Section 4.2.3.3.3.

For a comparison of two different buildings, which may have significantly different operational energy impacts, the exclusion of energy-consuming systems from the study boundary should only be made if the systems are identical or are demonstrated to not significantly change the study conclusions if omitted. In view of the above we propose that the exception be deleted without substitution.

Cost Impact: Will not increase the cost of construction

GG91-14 : 303.1 #3-HUMBLE720

GG92-14

303.1

Proponent: Jonathan Humble, AIA, NCARB, LEED AP-BD&C American Iron and Steel Institute, representing the American Iron and Steel Institute (jhumble@steel.org)

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1 Primary energy use.
 - 1.2 Acidification potential.
 - 1.3 Eutrophication potential.
 - 1.4 Ozone depletion potential.
 - 1.5 Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed ~~to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.~~
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Reason: Any exclusions of building components or materials must be made in accordance with ISO 14044. According to ISO 14044, Section 4.2.3.3.1, "The deletion of life cycle stages, processes, inputs or outputs are only permitted if it does not significantly change the overall conclusions of the study." Decisions regarding cut-off criteria must be made in accordance with the requirements of ISO 14044, Section 4.2.3.3.3.

To allow exclusions of materials from the LCA scope for the sole reason that they are not included in a particular LCA tool is not justifiable and could result in an incomplete LCA that does not comply with the ISO 14040-series standards.

In view of the above we propose that Subsection#8 be modified as shown.

Cost Impact: Will not increase the cost of construction

GG92-14: 303.1 #4-HUMBLE721

GG93-14

303.1, 303.2 (New), Table 303.2 (New)

Proponent: Proponent: Jonathan Humble, AIA, NCARB, LEED AP-BD&C American Iron and Steel Institute, representing the American Iron and Steel Institute (jhumble@steel.org)

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be in accordance with Section 303.2. ~~shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.~~
 - 1.1 Primary energy use.
 - 1.2 Acidification potential.
 - 1.3 Eutrophication potential.
 - 1.4 Ozone depletion potential.
 - 1.5 Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Add new text as follows:

303.2 Reference Building Design. The reference building design shall be determined in accordance with this section and the specifications in Table 303.2. The reference building shall be similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable

buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.

**TABLE 303.2
SPECIFICATIONS FOR THE PROPOSED AND REFERECE BUILDING DESIGNS**

<u>BUILDING COMPONENT CHARACTERISTICS</u>	<u>REFERENCE BUILDING DESIGN</u>	<u>PROPOSED DESIGN</u>
<u>Floor Areas</u>	<u>As required to provide the same usable floor area as the proposed design.</u>	<u>As proposed</u>
<u>Story Heights</u>	<u>As required to provide the same clear height between stories as the proposed design.</u>	<u>As proposed</u>
<u>Building Envelope and Structural Systems</u>	<u>The reference building design shall assume baseline materials and constructions designed to meet the structural requirements of the same edition of the International Building Code used for the proposed design. The assembly areas and mass of the reference building materials required to meet these structural requirements shall match those entered in the Life Cycle Assessment tool.</u>	<u>As proposed</u>
<u>Use Phase Energy Consumption</u>	<u>Use Phase energy shall be determined by one of the following methods: 1. <u>Predictive modeling of the reference building in accordance with the International Energy Conservation Code assuming the reference building just meets the prescriptive requirements of that code.</u> 2. <u>Using the energy use per square foot of buildings of the same principal activity from a nationally recognized building energy consumption survey database such as the Commercial Buildings Energy Consumption Database (CBECS)</u> 3. <u>Using the energy use per square foot determined by predictive modeling of a similar building chosen from a set of buildings intended to be representative of existing building stock as maintained by a nationally recognized program such as the US DOE Commercial Reference Building Models of the National Building Stock.</u></u>	<u>As determined by the predictive modeling used to show compliance with Section 602.1.1 when performance-based compliance is used or by a methodology approved by the code official when prescriptive-based compliance is used. Exception: <u>An assumed 10% reduction in energy use from the reference building design shall be permitted if prescriptive-based compliance is used.</u></u>

Reason: The purpose of Life Cycle Assessment is to accurately evaluate the impacts of alternate construction approaches relative to those of a baseline construction so that a level of confidence that impacts have been minimized is achieved for a given building. Theoretically, the baseline construction should represent a building that was likely to have been built had environmental impacts not been a primary concern beyond normal statutory considerations. This is the intent of the IgCC's implementation of LCA. However, the current provisions do not provide sufficient direction to ensure that this intent is fulfilled. It is the purpose of this proposal to provide that direction in a fashion consistent with other parts of the code.

This proposal utilizes the same approach at the IECC to evaluate energy performance relative to a baseline. The main difference being that instead of energy use, the impact categories of 303.1 provide the metrics being optimized. It provides a dedicated new section, 303.2, to contain the existing reference building design requirements.

Once the baseline construction is chosen, a pseudo-design using the materials of that construction can be performed in the context of the modern applicable code and the results of this design used for the baseline LCA. Table 302.2 provides guidelines used to conduct this pseudo-design. This table also allows for the designer to take advantage of strategies used to reduce the building size, and thus the environmental impact, by optimizing floor area and story height. Innovative structural designs which optimize usable area and story height are more favorably represented by comparing against a slightly larger reference building design. This is accomplished when the larger assembly areas of the reference building design are entered into in the LCA tool as required by the table.

Table 303.2 also provides an appropriate methodology to determine the operational energy effects over the building life cycle in the LCA results. No guidance at all is provided in the current IgCC in this respect. This represents a large potential inaccuracy since research has shown that the operational energy effects for most buildings are far greater than the one-time impacts experienced due to construction. There has been much research done on energy use of the existing building stock by the US government and the methodology presented in the table allows the designer to utilize that research to determine the operational energy use of the reference building design as opposed to having to guess it. This will result in far more accurate LCA results. In general, using the predictive modeling used to determine energy efficiency compliance is the best way to estimate the operational energy of the proposed building but the table also allows for a default 15% reduction in energy use when prescriptive-path compliance is used. This reduction is a conservative value but the proposal allows for other methods approved by the code official as well.

Cost Impact: Will not increase the cost of construction

GG93-14 : 303.1 #5-HUMBLE722

GG94-14

202 (New), 303.1, 303.2 (New), Table 303.2 (New), 303.2.1 (New)

Proponent: Jay Johnson, Thomas Associates, Inc. / Metal Building Manufacturers Association, representing Thomas Associates, Inc., representing the Metal Building Manufacturers Association (jjohnson@thomasamc.com)

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design ~~as specified in Section 303.2 of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.~~
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.

8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Add text as follows:

303.2 Reference Building Design. The reference building design shall be determined in accordance with this section and the specifications in Table 303.2. The reference building shall meet

the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.

**TABLE 303.2
SPECIFICATIONS FOR THE PROPOSED AND REFERENCE BUILDING DESIGNS**

<u>BUILDING COMPONENT CHARACTERISTICS</u>	<u>REFERENCE BUILDING DESIGN</u>	<u>PROPOSED DESIGN</u>
<u>Floor Areas</u>	<p align="center"><u>As proposed</u></p> <p><u>Exceptions:</u></p> <ol style="list-style-type: none"> <u>1. If measures are taken to reduce the size of the proposed building by combining areas that the study building(s) typically separated, then the reference building floor area may be determined assuming separate spaces for those areas</u> <u>2. If the structural and envelope systems chosen for the reference building design on the basis of the study building(s) significantly reduce the usable floor area from the proposed design, the footprint of the reference building design may be increased such that the usable floor areas are the same as the proposed design.</u> 	<u>As proposed</u>
<u>Story Heights</u>	<p align="center"><u>As proposed</u></p> <p><u>Exception:</u> <u>If the structural and envelope systems chosen for the reference building design on the basis of the study building(s) significantly reduce the clear height between stories, the story height of the reference building design may be increased such that the clear height is the same as the proposed design.</u></p>	<u>As proposed</u>
<u>Building Envelope and Structural Systems</u>	<p><u>The reference building design shall assume the materials and constructions used in the study building(s) but as designed to meet the structural requirements of the same edition of the International Building Code used for the proposed design. The assembly areas and mass of the reference building materials required to meet these structural requirements shall match those entered in the Life Cycle Assessment tool.</u></p>	<u>As proposed</u>
<u>Operational Energy</u>	<p align="center"><u>As determined by one of the following methods:</u></p> <ol style="list-style-type: none"> <u>1. Predictive modeling of the reference building in accordance with the International Energy Conservation Code assuming the reference building just meets the prescriptive requirements of that code.</u> <u>2. Using the energy use per square foot of buildings of the same principal activity from a nationally recognized building energy</u> 	<p align="center"><u>As determined by the predictive modeling used to show compliance with Section 602.1.1 when performance-based compliance is used or by a methodology approved by the code official when prescriptive-based compliance is used.</u></p>

<u>BUILDING COMPONENT CHARACTERISTICS</u>	<u>REFERENCE BUILDING DESIGN</u>	<u>PROPOSED DESIGN</u>
	<u>consumption survey database such as the Commercial Buildings Energy Consumption Database (CBECS)</u> 3. <u>Using the energy use per square foot determined by predictive modeling of a similar building chosen from a set of buildings intended to be representative of existing building stock as maintained by a nationally recognized program such as the US DOE Commercial Reference Building Models of the National Building Stock.</u>	<u>Exception: An assumed 10% reduction in energy use from the reference building design shall be permitted if prescriptive-based compliance is used.</u>

303.2.1 Reference Building Construction. A study of existing buildings within the same jurisdiction shall be conducted to determine the materials and constructions assumed for the reference building design. This study shall identify at least one and no more than three study building(s) built within the previous 50 years of similar size, occupancy and function as the proposed building. If no such buildings exist, then the geographical scope shall be increased in radius from the project site until at least one building can be identified.

Add new definition as follows:

SECTION 202 DEFINITIONS

STUDY BUILDING. A building identified in the study conducted in accordance with Section 303.2.1 that is used to establish the construction of the reference building design for Life Cycle Assessment purposes.

Reason: The purpose of Life Cycle Assessment is to accurately evaluate the impacts of alternate construction approaches relative to those of a baseline construction so that a level of confidence that impacts have been minimized is achieved for a given building. Theoretically, the baseline construction should represent a building that was likely to have been built had environmental impacts not been a primary concern beyond normal statutory considerations. This is the intent of the IgCC's implementation of LCA. However, the current provisions do not provide sufficient direction to ensure that this intent is fulfilled. It is the purpose of this proposal to provide that direction in a fashion consistent with other parts of the code. This proposal utilizes the same approach at the IECC to evaluate energy performance relative to a baseline. The main difference being that instead of energy use, the impact categories of 303.1 provide the metrics being minimized. It provides a dedicated new section, 303.2, to contain the existing reference building design requirements along with a subsection, 303.2.1, to give a methodology by which appropriate materials and constructions are selected for the reference building design. The latter set of requirements is completely missing from the current version of the IgCC.

The methodology of proposed Section 303.2.1 is straightforward: In order to provide an appropriate baseline construction, it must first be determined what types of materials would have been used if minimization of environmental impact was not a primary project goal. The existing building stock in a given region will provide an accurate record of this. Therefore, by conducting a survey of this building stock, either by visual inspection or by examining permit documentation, a building of similar size and function as the proposed building can be easily identified. Termed the "study building", the constructions used on this building will provide an appropriate baseline construction against which the proposed construction can be evaluated.

A definition for 'study building' has been proposed.

Once the baseline construction is determined, a pseudo-design using the materials of that construction can be performed in the context of the modern applicable code and the results of this design used for the baseline LCA. Table 302.2 provides guidelines used to conduct this pseudo-design. This table also allows for the designer to take advantage of strategies used to reduce the building size, and thus the environmental impact, by optimizing floor area and story height. Innovative structural designs which optimize usable area and story height are more favorably represented by comparing against a slightly larger reference building design. This is accomplished when the larger assembly areas of the reference building design are entered into in the LCA tool as required by the table.

Table 303.2 also provides an appropriate methodology to determine the operational energy effects over the building life cycle in the LCA results. No guidance at all is provided in the current IgCC in this respect. This represents a large potential inaccuracy since research has shown that the operational energy effects for most buildings are far greater than the one-time

impacts experienced due to construction. There has been much research done on energy use of the existing building stock by the US government and the methodology presented in the table allows the designer to utilize that research to determine the operational energy use of the reference building design as opposed to having to guess it. This will result in far more accurate LCA results. In general, using the predictive modeling used to determine energy efficiency compliance is the best way to estimate the operational energy of the proposed building but the table also allows for a default 10% reduction in energy use when prescriptive-path compliance is used. This reduction is a conservative value but the proposal allows for other methods approved by the code official as well.

Cost Impact: Will not increase the cost of construction

GG94-14 : 303.1-JOHNSON684

GG95-14

303, 303.1, 505.1

Proponent: Mark Nowak, representing Steel Framing Alliance

Delete without substitution:

SECTION 303 WHOLE BUILDING LIFE CYCLE ASSESSMENT

~~303.1 Whole building life cycle assessment.~~ Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

- ~~1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building. The reference and project buildings shall utilize the same life cycle assessment tool.
 - ~~1.1. Primary energy use.~~
 - ~~1.2. Acidification potential.~~
 - ~~1.3. Eutrophication potential.~~
 - ~~1.4. Ozone depletion potential.~~
 - ~~1.5. Smog potential.~~~~
- ~~2. The reference and project buildings shall utilize the same life cycle assessment tool.~~
- ~~3. The life cycle assessment tool shall be approved by the code official.~~
- ~~4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.~~
- ~~5. Building process loads shall be permitted to be included.~~
- ~~6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.~~
- ~~7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.~~
- ~~8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.~~
- ~~9. The life cycle assessment shall conform to the requirements of ISO 14044.~~

Revise as follows:

505.1 Material selection and properties. Building materials shall conform to Section 505.2.

Exceptions:

1. ~~Electrical, mechanical, plumbing, security and fire detection, and alarm equipment and controls, automatic fire sprinkler systems, elevators and conveying systems shall not be required to comply with Section 505.2.~~
2. ~~Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505.2 shall not be required.~~

Reason: LCA is not an appropriate method for the IgCC or any building code for the following reasons:

1. Buildings that use energy are very different in their impacts compared to individual products or other uses of materials because the energy use during the building's life is the dominant variable and it is already addressed in the code. The ability to differentiate between different materials in a building that uses energy throughout its life is insignificant and falls outside normal ranges of statistical acceptability.
 2. LCA has significant technical limitations that make it inappropriate for use in assessing a building design.
 3. The use of LCA as included in the IgCC leaves open the opportunity to conduct LCA studies that are not in compliance with the ISO standards.
 4. LCA is not an equivalent "trade-off" to the prescriptive path requirements in the IgCC.
- Specific comments related to each of these points are as follows:

Buildings that use energy are very different in their impacts compared to individual products and other uses of materials.

Unlike many consumer products that use little or no energy after their transportation stage, the operational energy in a conditioned building represents 95 to 97% of the emissions over the life of a building. This overwhelms the impact of any other decision. The remaining 3 to 5% leaves little ability to differentiate between products. The potential improvement from selecting differing materials or products would only be a fraction of that 3% to 5%. Conducting an LCA study and requiring its enforcement by code officials is an expensive process to go through for little to no possible improvement.

Precision and other uncertainty associated with an LCA is rarely reported but is generally greater than the percentage that can be changed by substituting different products. Studies suggest the error related to just the LCI phase is greater than 10% (see for example Athena Institute study at <http://www.cement.ca/images/stories/athena%20report%20Feb.%202%202007.pdf> . Total error would be much greater. The outcomes are in the range of statistical noise when applied to building materials.

LCA has some significant technical limitations that make it inappropriate for use in assessing a building design.

1. A comprehensive LCA, which is the only acceptable form of an LCA, is not feasible for buildings due to a lack of data. The current section 303.1 of the code attests to this fact in items number 7 and 8 that arbitrarily exclude systems and components for which data does not exist. Buildings have thousands of different materials and components. Without assessing every one of them in a comprehensive manner, there is no way to determine if the excluded items will have a significant impact.
2. LCA relies on subjective scope, boundary decisions and value judgments. The results of an LCA are neither reproducible nor comparable to other LCAs.
3. An LCA does not demonstrate environmental impacts but only provides a relative outcome. There are no thresholds established to determine whether a specific outcome is good or bad. There is no way to distinguish good versus bad products or buildings through an LCA.
4. LCA as currently practiced, does not account for time-dependent or spatial (point versus nonpoint) releases, or existing conditions of the local and regional areas impacted.

Unless the impact on a specific building location and the originating location of all materials in the building is considered, a building official could be approving buildings that are contributing to significant degradation of the environment.

The use of LCA as included in the IgCC leaves open the opportunity to conduct LCA studies that are not in compliance with the ISO standards

1. The ISO standards for LCA require the data to be representative for the materials or products being used. This data does not exist and instead, is being substituted with industry average data. By definition, average data rewards the lower performing materials and penalizes the better performing ones. It can result in the code official approving materials that may very well be seriously degrading the local environment.
2. The impact measures listed in the IgCC were selected for convenience. The requirements omit key impact measures of biodiversity, human health, land clearing, and others that are as or more important than the measures listed. A study done in accordance with the IgCC fails to meet the ISO requirements to be comprehensive given that all materials and activities degrade bio-diversity and other land use issues to some extent. Without these impact measures, code officials could approve buildings with materials that degrade the environment significantly.

3. The IgCC as currently written would allow selection of a building that performs lower on some impacts, as long as it improves in at least two others plus global warming potential. The lower performance could be devastating to a local habitat or sensitive area but could be ignored by selecting other impacts for improvement. Yet the building official would approve this without even being informed of the potential negative impact of the decision.
4. It is not possible to use a life-cycle assessment "tool" as permitted in the code and comply with the ISO standard that is referenced. Although there are some tools that can be used in the conduct of an LCA, there is no tool that can be used by itself to conduct a full ISO 14044-compliant LCA. Tools are aids much like a designer might use a spreadsheet but can't be used exclusively to conduct an LCA in accordance with the ISO standards.

LCA is not an equivalent trade-off for the prescriptive requirements in the IgCC.

The prescriptive requirements in the IgCC and the base codes upon which the IgCC builds typically address measurable improvements to the performance of a building. LCA, on the other hand, is a vague and subjective replacement that only serves as a relative point of comparison on selective and subjective environmental impacts. The uncertainty associated with an LCA study is unacceptable for a building code of any kind. Building officials would need to be trained to interpret the results of an LCA. This is an extra burden that is not necessary to ensure a high performing building. The LCA option should be deleted entirely from the code.

¹A LIFE CYCLE PERSPECTIVE ON CONCRETE AND ASPHALT ROADWAYS:
EMBODIED PRIMARY ENERGY AND GLOBAL WARMING POTENTIAL, Athena institute, Ottawa,
Ontario, Canada, S e p t e m b e r 2006.

Cost Impact: Will not increase the cost of construction.

GG95-14 : 303.1-NOWAK414

GG96-14

303.1

Proponent: Wayne Trusty, Wayne B. Trusty & Associates Limited, representing Wayne B. Trusty & Associates Limited (wtrusty@sympatico.ca)

Revise as follows:

303.1 Whole building life cycle assessment.

Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall conform to the requirements of ASTM E2921 and ISO 14044 and be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1. Primary energy use.
 - 1.2. Acidification potential.
 - 1.3. Eutrophication potential.
 - 1.4. Ozone depletion potential.
 - 1.5. Smog potential.
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
 5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. ~~The life cycle assessment shall conform to the requirements of ISO 14044.~~

Add new standard(s) as follows:

ASTM

E2921-13 Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems

Reason: Life Cycle Assessment, or LCA, involves assessing the various environmental impacts associated with using particular products or materials. This practice provides criteria to be applied irrespective of the assessment (LCA) tool that is used when LCA is undertaken at the whole building level to compare a final whole building design to a reference building design.

The purpose of this Practice is to support the use of whole building Life Cycle Assessment (LCA) in this code by ensuring that comparative assessments of final whole building designs relative to reference building designs take account of the relevant building features, life cycle stages, and related aspects in similar fashion for both the reference and final building designs of the same building.

The criteria do not deal with building occupant behavior, possible future changes in building function, building rehabilitation or retrofit, or other matters that cannot be foreseen or reasonably estimated at the design and/or permitting stage where this Practice applies. It is intended to provide an adequate framework that will ensure, as stated above, that any LCA is done in similar fashion and the output of the process is comparative, giving relative meaning to the results.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2921 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG96-14 : 303.1 #1-TRUSTY653

GG97-14

303.1

Proponent: Wayne Trusty, representing Wayne B. Trusty & Associates Limited
(wtrusty@sympatico.ca)

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall conform to the requirements of ASTM E2921 and ISO 14044 and be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1 Primary energy use.
 - 1.2 Acidification potential.
 - 1.3 Eutrophication potential.
 - 1.4 Ozone depletion potential.
 - 1.5 Smog potential.
- ~~2. The reference and project buildings shall utilize the same life cycle assessment tool.~~
- ~~3.2.~~ The life cycle assessment tool shall be *approved* by the code official.
- ~~4.3.~~ Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
- ~~5. Building process loads shall be permitted to be included.~~
- ~~6.4.~~ Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
- ~~7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.~~

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
- ~~8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.~~
- ~~9. The life cycle assessment shall conform to the requirements of ISO 14044.~~

Add new standard as follows:

ASTM

E2921-13 Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems

Reason: The ASTM practice regarding whole building Life Cycle Assessment (LCA) provides criteria to be applied irrespective of the LCA tool that is used to compare a final whole building design to a reference building design. The criteria cover many of the 303.1 sub-clauses and those clauses could therefore be deleted from 303.1 if the ASTM practice is included as previously proposed. The affected clauses are identified below with strike through, followed in each case by identification of the relevant clause in the ASTM **practice** (ASTM E2921-13).

1. (No change)
2. ~~The reference and project buildings shall utilize the same life cycle assessment tool. **Required by ASTM Practice clause 6.4.2**~~
3. ~~2. The life cycle assessment tool shall be *approved* by the code official.~~
4. ~~3. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.~~
5. ~~Building process loads shall be permitted to be included. **ASTM 6.2.3**~~
6. ~~4. Maintenance and replacement schedules and actions for components shall be included in the assessment. **ASTM 6.2.1** For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.~~
7. ~~The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed. **ASTM 6.2.1**
EXCEPTION: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment. **ASTM 6.3.3**~~
8. ~~The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool. **ASTM 6.3.1 and 6.3.4**~~
9. ~~The life cycle assessment shall conform to the requirements of ISO-14044 **ASTM 4.1**~~

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2921 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG97-14 : 303.1 #2-TRUSTY677

GG98-14

303.1

Proponent: Martha VanGeem, representing self

Revise as follows:

303.1 Whole building life cycle assessment. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505 shall not be required. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20-percent improvement in environmental performance for global warming potential and at least ~~three~~ two of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *International Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
 - 1.1 Primary energy use.
 - 1.2 Acidification potential.
 - 1.3 Eutrophication potential.
 - 1.4 Ozone depletion potential.
 - 1.5 Smog potential.
 - 1.6 Ecotoxicity
2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be *approved* by the *code official*.
4. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.

Exception: Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators and conveying systems shall not be included in the assessment.
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Reason: Life-cycle assessment allows the evaluation of the environmental impact of a building. Although there are many environmental impact categories, only five are included in the first edition of the IgCC (global warming potential, acidification potential, eutrophication potential, ozone depletion potential, and smog potential). These five environmental impact categories were included because, at the time of development of the first edition of the IgCC, each had an internationally established method to back its characterization factors. In the last three years, the eco-toxicity model (USEtox) has been significantly revised and refined its characterization factors for eco-toxicity, and they have been incorporated into the LCA tools. Thus we propose including eco-toxicity as an environmental impact category in the IgCC. Also, we propose to increase the required number of impacts for compliance to three plus global warming potential.

What is eco-toxicity

Although the original five environmental impact categories cover a wide-range of potential environmental effects, none of them fully address ecological toxicity. The impact factor, eco-toxicity potential, is a measure of the potential of chemicals released into the environment to harm terrestrial and aquatic ecosystems.

What is USEtox

USEtox is a model based on scientific consensus for characterizing human and eco-toxicological impacts of chemicals in life-cycle impact assessments. The USEtox model was developed by a team of international researchers from the Task Force on Toxic Impacts under the United Nations Environment Program (UNEP) and the Society for Environmental Toxicology and Chemistry (SETAC) Life-Cycle Initiative (www.usetox.org).

USEtox developers

The United Nations Environment Program (UNEP) and the Society for Environmental Toxicology and Chemistry (SETAC) launched a global Life Cycle Initiative to enable users around the world to put life cycle thinking into effective practice.

Task Force on Toxic Impacts aims at establishing recommended practice and guidance for use for the ecotoxicity, human toxicity and related categories with direct effects on human health, i.e: Ecotoxicity, human toxicity, ionizing radiation, accidents and noise. The task force addresses midpoint categories and their relation to damage categories human health and biotic natural environment.

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Hauschild, M.Z., Huijbregts, M.A.J., Jolliet, O., Macleod, M., Margni, M.D., van de Meent, D., Rosenbaum, R.K., McKone, T.E., 2008. Building a Model Based on Scientific Consensus for Life Cycle Impact Assessment of Chemicals: The Search for Harmony and Parsimony. *Environmental Science and Technology* 42, 7032-7037.

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Cost Impact: Will not increase the cost of construction

GG98-14 : 303.1-VANGEEM1107

GG99-14

NUMBER NOT USED

GG100-14

401.2

Proponent: Gregory Johnson, representing Outdoor Power Equipment Institute
(gjohnsonconsulting@gmail.com)

Revise as follows:

401.2 Predesign site inventory and assessment. An inventory and assessment of the natural resources and baseline conditions of the building site shall be submitted with the construction documents. The inventory and assessment shall:

1. Determine the location of any protection areas identified in Section 402.1 that are located on, or adjacent to, the building site;
2. Determine whether, and to the degree to which, the native soils and hydrological conditions of the building site have been disturbed and altered by previous use or development;
3. Identify *invasive plant species* on the site for removal; and
4. Identify native plant species on the site.
5. Identify site features to be preserved.

Reason: The pre-design inventory and assessment should include any site features to be preserved. This would include features unaddressed by Sec. 402 like rock formations or certain mature trees that may be protected by regulation or by the choice of the owner.

Cost Impact: Will not increase the cost of construction.

GG100-14: 401.2-JOHNSON546

GG101-14

401.2, 402.1 (New)

Proponent: Craig Conner, Self, representing self (craig.conner@mac.com)

Delete without substitution:

~~401.2 Predesign site inventory and assessment.~~

~~An inventory and assessment of the natural resources and baseline conditions of the building site shall be submitted with the construction documents.~~

~~The inventory and assessment shall:~~

- ~~1. Determine the location of any protection areas identified in Section 402.1 that are located on, or adjacent to, the building site;~~
- ~~2. Determine whether, and to the degree to which, the native soils and hydrological conditions of the building site have been disturbed and altered by previous use or development;~~
- ~~3. Identify *invasive plant species* on the site for removal; and~~
- ~~4. Identify native plant species on the site.~~

Add new text as follows:

402.1 Protected areas. Construction shall comply with jurisdictional, state and Federal regulations concerning park lands, agricultural lands, flood hazard areas, conservation areas, greenfields, brownfields, sites adjacent to surface water bodies and wetlands. The construction documents shall indicate the location of the protected areas on, or adjacent to the building site. The construction documents shall indicate the required buffer zones around protected areas.

Reason: Many of these are zoning functions. Many are non-code laws or Federal functions. This existing section will usually need to be heavily amend (or deleted) to be used. Noting the protected areas on the construction documents is helpful.

Cost Impact: Will not increase the cost of construction

GG 101-14: 401.2-CONNER1198

GG102-14

401.2, 405.1.1

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC)

Revise as follows:

401.2 Predesign site inventory and assessment. An inventory and assessment of the natural resources and baseline conditions of the building site shall be submitted with the construction documents.

The inventory and assessment shall:

1. Determine the location of any protection areas identified in Section 402.1 that are located on, or adjacent to, the building site;
2. ~~Determine whether, and to the degree to which, the native soils and hydrological conditions of the building site have been disturbed and altered by previous use or development;~~
3. Identify *invasive plant species* on the site for removal; and
4. Identify native plant species on the site.

405.1.1 Soil and water quality protection plan. A soil and water quality protection plan shall be submitted by the owner and *approved* prior to construction. The protection plan shall address the following:

1. A soils map, site plan, or grading plan that indicates designated soil management areas for all site soils, including, but not limited to:
 1. Soils that will be retained in place and designated as vegetation and soil protection areas (VSPAs).
 2. Topsoils that will be stockpiled for future reuse and the locations for the stockpiles.
 3. Soils that will be disturbed during construction and plans to restore disturbed soils and underlying subsoils to soil reference conditions.
 4. Soils that will be restored and re-vegetated.
 5. ~~Soils disturbed by previous development that will be restored in place and re-vegetated.~~
 6. Locations for all laydown and storage areas, parking areas, haul roads and construction vehicle access, temporary utilities and construction trailer locations.
 7. Treatment details for each zone of soil that will be restored, including the type, source and expected volume of materials, including compost amendments, mulch and topsoil.
 8. A narrative of the measures to be taken to ensure that areas not to be disturbed and areas of restored soils are protected from compaction by vehicle traffic or storage, erosion, and contamination until project completion.
2. A written erosion, sedimentation and pollutant control program for construction activities associated with the project. The program shall describe the best management practices (BMPs) to be employed including how the BMPs accomplish the following objectives:
 1. Prevent loss of soil during construction due to stormwater runoff or wind erosion, including the protection of topsoil by stockpiling for reuse.
 2. Prevent sedimentation of stormwater conveyances or *receiving waters* or other public infrastructure.
 3. Prevent polluting the air with dust and particulate matter.
 4. Prevent runoff and infiltration of other pollutants from construction site, including, but not limited to thermal pollution, concrete wash, fuels, solvents, hazardous chemical runoff, pH and pavement sealants. Ensure proper disposal of pollutants.
 5. Protect from construction activities the designated vegetation and soil protection areas, *flood hazard areas* and other areas of vegetation that will remain on site.

3. A written periodic maintenance protocol for landscaping and stormwater management systems, including, but not limited to:
 1. A schedule for periodic watering of new planting that reflects different water needs during the establishment phase of new plantings as well as after establishment. Where development of the building site changed the amount of water reaching the preserved natural resource areas, include appropriate measures for maintaining the natural areas.
 2. A schedule for the use of fertilizers appropriate to the plants species, local climate and the preestablishment and post-establishment needs of the installed landscaping. Nonorganic fertilizers shall be discontinued following plant establishment.
 3. A requirement for a visual inspection of the site after major precipitation events to evaluate systems performance and site impacts.
 4. A schedule of maintenance activities of the stormwater management system including, but not limited to, cleaning of gutters, downspouts, inlets and outlets, removal of sediments from pretreatment sedimentation pits and wet detention ponds, vacuum sweeping followed by high- pressure hosing at porous pavement and removal of litter and debris.
 5. A schedule of maintenance activities for landscaped areas including, but not limited to, the removal of dead or unhealthy vegetation; reseeding of turf areas; mowing of grass to a height which optimizes lawn health and retention of precipitation.

Reason: If all disturbed soils to be restored and re-vegetated are required to be identified on the soil and water quality protection plan there is no need to identify when (previous development) the soil disturbance took place. The information re: previous development is moot and should be stricken.

Other than Section 405.1.1 and the “*previous development*” language proposed for deletion, there is no place in the code that requires the code official to have or use information about the historical use or alteration of the soil or the site hydrology.

There is no point in the code requiring extensive and expensive analysis of the history of a site when the information will not be used to regulate the site. If the owner or designer wants this information they are free to pursue it on a voluntary basis.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG102-14: 401.2-THOMPSON736

GG103-14

202, 401.2, 405.1.1, 405.2.2

Proponent: Brenda Thompson, representing SEHPCAC

Revise as follows:

SECTION 202 DEFINITIONS

SITE DISTURBANCE. ~~Site preparation or construction which negatively affects the native soils, native vegetation, or native animal life of the site~~ Areas of the building site that are altered, or have been altered, for site preparation or construction.

Revise as follows:

401.2 Predesign site inventory and assessment. An inventory and assessment of the natural resources and baseline conditions of the building site shall be submitted with the construction documents.

The inventory and assessment shall:

1. Determine the location of any protection areas identified in Section 402.1 that are located on, or adjacent to, the building site;
2. Determine whether, and to the degree to which, the native soils and hydrological conditions of the building site have been disturbed and altered by previous use or development;
3. Identify *invasive plant species* on the site for removal or containment; and
4. Identify native plant species on the site.

405.1.1 Soil and water quality protection plan. A soil and water quality protection plan shall be submitted by the owner and *approved* prior to construction. The protection plan shall address the following:

1. A soils map, site plan, or grading plan that indicates designated soil management areas for all site soils, including, but not limited to:
 1. Soils that will be retained in place and designated as vegetation and soil protection areas (VSPAs).
 2. Topsoils that will be stockpiled for future reuse and the locations for the stockpiles.
 3. Soils that will be disturbed during construction and plans to restore disturbed soils and underlying subsoils to soil reference conditions.
 4. Soils that will be restored and re-vegetated.
 5. Soils disturbed by previous development that will be restored in place and re-vegetated.
 6. Locations for all laydown and storage areas, parking areas, haul roads and construction vehicle access, temporary utilities and construction trailer locations.
 7. Treatment details for each zone of soil that will be restored, including the type, source and expected volume of materials, including compost amendments, mulch and topsoil.
 8. A narrative of the measures to be taken to ensure that areas not to be disturbed and areas of restored soils are protected from compaction by vehicle traffic or storage, erosion, and contamination until project completion.
2. A written erosion, sedimentation and pollutant control program for construction activities associated with the project. The program shall describe the best management practices (BMPs) to be employed including how the BMPs accomplish the following objectives:
 1. Prevent loss of soil during construction due to stormwater runoff or wind erosion, including the protection of topsoil by stockpiling for reuse.
 2. Prevent sedimentation of stormwater conveyances or *receiving waters* or other public infrastructure.

3. Prevent polluting the air with dust and particulate matter.
4. Prevent runoff and infiltration of other pollutants from construction site, including, but not limited to thermal pollution, concrete wash, fuels, solvents, hazardous chemical runoff, pH and pavement sealants. Ensure proper disposal of pollutants.
5. Protect from construction activities the designated vegetation and soil protection areas, *flood hazard areas* and other areas of vegetation that will remain on site.
3. A written periodic maintenance protocol for landscaping and stormwater management systems, including, but not limited to:
 1. A schedule for periodic watering of new planting that reflects different water needs during the establishment phase of new plantings as well as after establishment. Where development of the building site changed the amount of water reaching the preserved natural resource areas, include appropriate measures for maintaining the natural areas.
 2. A schedule for the use of fertilizers appropriate to the plants species, local climate and the preestablishment and post-establishment needs of the installed landscaping. Nonorganic fertilizers shall be discontinued following plant establishment.
 3. A requirement for a visual inspection of the site after major precipitation events to evaluate systems performance and site impacts.
 4. A schedule of maintenance activities of the stormwater management system including, but not limited to, cleaning of gutters, downspouts, inlets and outlets, removal of sediments from pretreatment sedimentation pits and wet detention ponds, vacuum sweeping followed by high- pressure hosing at porous pavement and removal of litter and debris.
 5. A schedule of maintenance activities for landscaped areas including, but not limited to, the removal of dead or unhealthy vegetation; reseeding of turf areas; mowing of grass to a height which optimizes lawn health and retention of precipitation.
 6. A written control program for the containment of invasive plant species on the building site.

405.2.2 Invasive plant species. *Invasive plant species* shall not be planted on a building site. Invasive plant species shall be removed from the area of site disturbance or where otherwise required by law. Where not required to be removed, a management plan for the containment of invasive plant species shall be submitted and implemented in accordance with Section 405.1.1.

~~A management plan for the containment, removal and replacement of any *invasive plant species* currently on the site shall be generated based on either published recommendation for the referenced invasive plant or guidance prepared by a qualified professional. Existing vegetation that is to be retained on a building site shall be protected as required by Section 405.2.~~

Reason: The definition of *site disturbance* is too subjective; “*negatively affects*” can be a matter of perspective, one person’s improvement is another person’s mistake. Additionally, under the current definition a site cannot be defined as disturbed if native soils, plants, or animals are not affected which is problematic for many urban sites and virtually all agricultural lands.

The first stricken sentence of Sec. 405.2.2 is sloppy code; it requires a management plan to be “*generated*” but never actually submitted. It similarly does not require the actual removal of invasive species; just that a plan be generated.

One option requires the plan to be based upon a published recommendation re: the invasive species but does not give any direction as to what the source should be; where published, when, and by who are not specified. By this language an internet blog could be the basis of the generated plan.

The other option, that the plan be generated based on “*guidance prepared by a qualified professional,*” is similarly flawed. What exactly is a prepared guidance is not specified; meaning it is potentially not in writing or subject to review. How the qualifications of the professional who prepares the guidance are established is also un-addressed. Is the crop farmer who sold the site to the developer a qualified professional? He knows plants and he knows herbicide; is that enough?

The last stricken sentence is superfluous; Section 405.2 speaks for itself. A reference from a subsection, 405.2.1.2, to the related charging section, 405.2, does not add clarity or value.

The new language of the proposal clarifies that invasive plant removal requirements apply to only the disturbed areas of the site. The building site could be hundreds of acres or more in size, while the area of actual disturbance a relatively small area. Invasive species, by definition, include noxious weeds. It is important to clarify that the developer is not required to automatically remove invasive species throughout. Imagine if a developer was tasked to eliminate the poison ivy or kudzu from a 1,000 acre wooded site when the disturbed area of the site is less than 87,120^{Sf} (2 acres).

The new language also clarifies that those areas of invasive plant species on the building sites that are not required to be removed should still be contained. References to new "containment" language in Sec. 401.2 item 3 and Sec. 405.1.1 item 3.6 further clarify the requirement.

The added reference to "*otherwise required by law*" ensures that where the applicable authority has determined that retroactive requirements for the removal of certain plant species are warranted that those removals will be addressed as part of site development. There are a handful of jurisdictions that have these requirements.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will increase the cost of construction.

GG103-14: 405.1.1-THOMPSON737

GG104-14

202, 302.1, 402.3 (NEW)

Proponent: John McShane, U.S. Environmental Protection Agency, representing USEPA and Alan Luloff, Association of State Flood Plain Managers

Add new definition as follows:

SECTION 202 DEFINITIONS

500-YEAR FLOODPLAIN. The area within a floodplain subject to a 0.2-percent or greater chance of flooding in any given year.

Revise as follows:

302.1 Requirements determined by the jurisdiction.

The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 1. SCOPE			
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	No

101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 4. SITE DEVELOPMENT AND LAND USE			
402.2.1	Flood hazard area preservation, general	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.2.2	Flood hazard area preservation, specific	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.3</u>	<u>Protection of high-risk buildings and</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.3 <u>402.4</u>	Surface water protection	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.5 <u>402.6</u>	Conservation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.7 <u>402.8</u>	Agricultural	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.8</u> <u>402.9</u>	Greenfield sites	<input type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.1	High-occupancy vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.2	Low-emission, hybrid and electric vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
409.1	Light pollution control	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY			
503.1	Minimum percentage of waste material diverted from landfills	<input type="checkbox"/> 50% <input type="checkbox"/> 65% <input type="checkbox"/> 75%	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO^{2e} EMISSION			
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: ____ zEPI: _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 7. WATER RESOURCE CONSERVATION, QUALITY AND EFFICIENCY			
702.7	Municipal reclaimed water	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT			
804.2	Post-Construction Pre-Occupancy Baseline IAQ	<input type="checkbox"/> Yes	<input type="checkbox"/> No
807.1	Sound transmission and sound levels	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post Certificate of Occupancy zEPI, energy demand, and CO ^{2e}	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Add new text as follows:

402.3 Protection of high-risk buildings and structures. Where this section is indicated to be applicable in Table 302.1, *buildings* and *structures* classified as risk categories III or IV in accordance with Section 1604.5 of the *International Building Code* shall not be located within a 500-year floodplain.

Reason: The purpose of this proposal is to provide communities with an option to maximize the protection of buildings that offer essential services or that in severe floods present high risk to building occupants or the larger community. Such buildings, often referred to as "critical facilities," include buildings that offer shelter during times of emergency, buildings that house community protection services, water treatment facilities, facilities that house people who are immobile, and so forth. The *International Building Code* categorizes these buildings as Risk Category III and IV.

Increased levels of freeboard is one approach to protecting such facilities, but could be insufficient, particularly in communities that are highly vulnerable to sea level rise. Coastal communities may want to use climate change adaptation strategies that minimize the risk of damage to critical facilities, strategies that take into consideration the reduced predictability of hydrologic and meteorological conditions. The placement of critical facilities outside of the 500 year floodplain is one such approach.

Cost Impact: Will increase the cost of construction.

GG104-14: 402.3 (NEW)-GITLIN810

GG105-14

302.1, 402.2., 402.2.3 (NEW), 402.2.3

Proponent: John McShane, U.S. Environmental Protection Agency, representing USEPA and Alan Luloff, Association of State Flood Plain Managers

Revise as follows:

302.1 Requirements determined by the jurisdiction.

The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 1.			
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single- family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	No
101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	No
CHAPTER 4. SITE DEVELOPMENT AND LAND USE			
402.2.1	Flood hazard area preservation, general	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.2.2	Flood hazard area preservation, specific	<input type="checkbox"/> Yes	<input type="checkbox"/> No

402.2.3	Flood hazard area preservation, limitation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.3	Surface water protection	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.5	Conservation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.7	Agricultural	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.8	Greenfield	<input type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.1	High-occupancy vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.2	Low-emission, hybrid and electric vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
409.1	Light pollution control	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY			
503.1	Minimum percentage of waste material diverted from landfills	<input type="checkbox"/> 50% <input type="checkbox"/> 65% <input type="checkbox"/> 75%	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION			
302.1, 302.1.1, 602.1 604.1	zEPI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy	Occupancy: ___ zEPI: _____	
	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 7. WATER RESOURCE CONSERVATION, QUALITY AND EFFICIENCY			
702.7	Municipal reclaimed water	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT			
804.2	Post-Construction Pre-Occupancy Baseline IAQ	<input type="checkbox"/> Yes	<input type="checkbox"/> No
807.1	Sound transmission and sound levels	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post Certificate of Occupancy zEPI, energy demand, and CO ₂ e	<input type="checkbox"/> Yes	No

Revise as follows:

402.2. Flood hazard areas. For locations within *flood hazard areas*, unless compliance with Section 402.2.1, or Section 402.2.2, or Section 402.2.3 is required by Table 302.1, new buildings and structures and *substantial improvements* shall comply with Section 402.2.4 402.2.3.

Add new text as follows:

402.2.3 (New) Flood hazard area preservation, limitation on fill. Where this section is indicated to be applicable in Table 302.1, fill shall not be used to support slab-on-grade foundations for new buildings and structures and *substantial improvements*.

Revise as follows:

402.2.34 Development in flood hazard areas. New buildings, structures and *substantial improvements* constructed in *flood hazard areas* shall be in compliance with Section 1612 of the *International Building Code* provided the lowest floors are elevated or dry floodproofed to not less than 1 foot (25 mm) above the elevation required by Section 1612 of the *International Building Code*, or the elevation established by the jurisdiction, whichever is higher.

Reason: Fill used to elevate buildings in flood hazard areas can cause adverse environmental impacts. Most communities specify a maximum 2:1 slope or fill, in part to make lawn maintenance safer. That slope requirement can lead to significant areas of ground disturbance, loss of mature trees, and possible wetlands encroachment. Changes in drainage patterns can increase flooding of neighboring properties, creating liability for damage. Fill that is used to elevate buildings on slab foundations may slump when saturated or be eroded by moving flood waters, leading to structural damage when the slab is unsupported. For these reasons, some communities elect to limit the use of fill. This proposal gives communities that option, which has the added benefit of reinforcing other measures to preserve natural resources specified in Section 402. The National Flood Insurance Program's Community Rating System provides credits to communities that limit the use of fill, helping to reduce the cost of flood insurance for all property owners in those communities.

Cost Impact: Will not increase the cost of construction. This proposal could lower costs because, on average, elevating buildings on fill costs more than elevating buildings on other types of foundations.

GG105-14 : 402.2.3 (New) #2-GITLIN812

GG106-14

202, 402.2.3

Proponent: Susan Gitlin, representing USEPA
(gitlin.susan@epa.gov)

Add new definitions as follows:

SECTION 202 DEFINITIONS

FLOOD INSURANCE RATE MAP. An official map of a community on which the Federal Emergency Management Agency has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

SPECIAL FLOOD HAZARD AREA. The land area subject to flood hazards and shown on a Flood Insurance Rate Map or other flood hazard map as Zone A, AE, A1-30, A99, AR, AO, AH, V, VO, VE, or V1-30.

Revise as follows:

402.2.3 Development in flood hazard areas. New buildings, structures and *substantial improvements* constructed in *flood hazard areas* shall be in compliance with Section 1612 of the *International Building Code* provided the lowest floors are elevated or dry floodproofed to not less than 1 foot (25 mm) above the elevation required by Section 1612 of the *International Building Code*, or the elevation established by the jurisdiction, whichever is higher and, if located in riverine *flood hazard areas*, it has been demonstrated through hydrologic and hydraulic analyses performed by a registered design professional in accordance with standard engineering practice that the proposed buildings and structures, including associated grading or fill, when combined with all other existing and potential future *flood hazard area* encroachments, will not result in any increase in flood levels during the occurrence of the design flood and will not increase the floodwater velocity at the project site.

Exception: New buildings, structures and *substantial improvements* in *flood hazard areas* designated on the Flood Insurance Rate Map as Zone AO or Zone AH.

Reason: The costs of recovering from floods are the highest of all natural disasters and even with substantial federal, state and local government risk management efforts damage costs are on a steady upward trend. One of the reasons that the costs associated with flood recovery are increasing is encroachments into the floodplain (Galloway, 2013). Current minimum standards of the National Flood Insurance Program and the International Code Series -- and the current *International green Construction Code* -- allow encroachments into riverine floodplains that can cause up to a foot of increased flooding (see figure 1 below). These encroachments on-average pinch in conveyance areas to half their normal

width, increase flood velocities by one-third and cause the extent of the flood hazard area to increase by 10 percent (Lulloff, 2013).

Figure 1- impact of encroachments into riverine flood hazard areas

It is important to note that this section, as written, only applies in riverine flood hazard areas, not in areas subject to coastal flooding where encroachments such as fill do not affect the base flood elevation in the same way they affect riverine floodplains.

The engineering analysis methods required by these revisions are routinely used by civil engineers and the engineering models used are available in the public domain. FEMA provides guidance on the use of these engineering models on their web site. The engineer conducting the analysis basically runs the analysis without the proposed encroachment (pre-development condition), and then uses the model to show the effect of the encroachment. The engineering model output shows the resulting differences in both flood elevations and flow velocities.

Construction that encroaches into the floodplain negatively impacts floodplain ecosystems and infringes upon the property rights of others by increasing flooding for existing development. A basic property legal principle that dates back to ancient Justinian (Roman) law is: "Sic utere tuo ut alienum non laedas", or "so use your own property that you do not injure others". Allowing new development that increases flood elevations and velocities on existing development injures others and therefore violates their property rights. (Kusler and Thomas, 2007; Thomas and Medlock, 2008) In addition, construction that encroaches into the floodplain is a public safety concern. Not only does it risk the health and safety of homeowners and their neighbors it puts at risk emergency response personnel that are called upon to rescue people trapped by flood water. More deaths are caused by flooding than any other natural disaster even though there is better knowledge about where flooding will occur than where tornados will strike, where forest fires will flare up and where the earth will quake.

Allowing new development to encroach into floodplains and increase flood elevations also impacts that long-term viability of the community. Allowing increased flooding increases costs for maintaining infrastructure (roads, bridges, sewer and water, pumping stations) and often results in blighted areas and commercial operations being closed for periods of time.

This revision is consistent with the National Flood Insurance Program which explicitly supports community standards that are higher than the federal minimum. One of the mechanisms FEMA uses to provide financial incentives to communities that adopt higher standards is the Community Rating System (CRS). Communities that adopt this component of the IgCC could be eligible for up to 110 points under the CRS program. Seven States and significant number of communities have restrictions on encroachments that go beyond the federal minimum.

These code revisions will help ensure that this "green" building code serves to prevent building construction that increases flooding on existing development or negatively impacts floodplain ecosystems. It should be noted that while these revisions minimize adverse impacts there are areas of the SFHA in which there is little or no velocity and therefore these revisions will not preclude any and all development in the SFHA.

The proposal in Section 402.2.3 closes an often exploited aspect of hydrologic and hydraulic analyses that allows an engineer to manipulate the roughness coefficient to obtain favorable results. For example, if an analysis shows that a proposed development with encroachment will increase flooding by a 0.3 of a foot trees could be removed to decrease friction to offset the increase. However, in doing so the flood water is sped up - in other words the velocity is increased (which in itself is a hazard because of increased scour, erosion, and hydrodynamic loads). Requiring no increase in flood velocity in addition to no increase in flood elevation closes this loop hole.

Bibliography:

Galloway, Gerald, 2013. Plenary presentation at Association of State Floodplain Managers Nation Flood Conference, June 13, 2013.

Kusler, Jon, Thomas, Edward, 2007. No Adverse Impact and the Courts: Protecting the Property Rights of All.

Lulloff, Alan, 2013. The Floodway Encroachment Standard: Minimizing Cumulative Adverse Impacts.

Thomas, Edward and Medlock, Samantha, 2008, Mitigating Misery: Land Use and Protection of Property Rights Before the Next Big Flood.

Cost Impact: Will increase the cost of construction. In floodplains where the NFIP and the I-Codes already require analysis of the effect of encroachments, there will be no additional cost associated with preparation of the analysis. There is an additional cost in the other areas. Long term cost savings to the homeowner and community could be substantial due to reduced flood damages recognizing that in some instances items damaged are irreplaceable (family heirlooms, photographs, etc.).

GG106-14: 402.2.3 #1-GITLIN811

GG107-14

402.3

Proponent: Susan Gitlin, U.S. Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov)

Revise as follows:

402.3 Surface water protection. Where this section is indicated to be applicable in Table 302.1, buildings and building site improvements shall not be located over, or located within, a ~~buffer~~ ~~buffer as established by the jurisdiction~~, around or adjacent to oceans, lakes, rivers, streams and other bodies of water that support or could support fish, recreation or industrial use. The width of the *buffer* shall be not less than the minimum *buffer* width shown in Table 402.3 or otherwise established by the jurisdiction. The ~~buffer~~ ~~buffer~~ shall be measured from the ordinary high-water mark of the body of water.

Exceptions:

1. Buildings and associated site improvements specifically related to the use of the water including, but not limited to, piers, docks, fish hatcheries, and habitat restoration facilities, shall be permitted where the impacts of the construction and location adjacent to or over the water on the habitat is mitigated.
2. Buildings and associated site improvements shall be permitted where a wetlands permit has been issued under a national wetlands permitting program or otherwise issued by the authority having jurisdiction.

TABLE 402.3(1)
SURFACE WATER BUFFER WIDTHS*

<u>Surface water area (Acres)</u>	<u>Stream or river width (Feet)</u>	<u>Minimum buffer width (Feet)</u>
<u>< 5</u>	<u>< 15</u>	<u>50</u>
<u>5 to 30</u>	<u>15 to 40</u>	<u>75</u>
<u>> 30</u>	<u>> 40</u>	<u>100</u>

*For surface waters with surrounding slopes equal to or greater than 10 percent but less than 15 percent, an additional 10 feet of buffer shall be added. For surface waters with surrounding slopes equal to or greater than 15 percent but less than 20 percent, an additional 15 feet shall be added. For areas with surrounding slopes equal to or greater than 20 percent, an additional 30 feet shall be added.

Reason: "Buffer" is defined in Chapter 2, but is not italicized in Chapter 4, so we recommend that this editorial correction be made. A comma is added to improve the flow of the first sentence.

Section 402.3 requires that, should this section be required by the jurisdiction, buildings and site improvements stay outside of a buffer area. The width (distance) of the buffer is left to be determined by the jurisdiction, which some jurisdictions might find burdensome. The effective default for the buffer distance is therefore zero, which is at odds with the intent of the section. This proposal presents a set of buffer distances that would serve as the default set of distances should the jurisdiction not be prepared to set the distances, or serves as guidance for a jurisdiction in its decision-making.

The distances provided in this table are based on scientific studies of the contributions of various-sized buffers to the protection of surface water areas and associated wildlife habitat, as well as on studies of the approaches to setting buffer distances adopted in ordinances.

The proposed table calls for increased distances for waterways located next to slopes of 10% as higher, as slopes are prone to increased erosion and runoff, both of which can damage water quality through increased loading of sediment and various pollutants. This reduces the ability of the water body to effectively filter pollutants and hurts its ecological productivity.

Bibliography:

DeLuca, W. V., C. E. Studds, and P. P. Marra. 2004. "The Influence of Land Use on the Integrity of Marsh Bird Communities of the Chesapeake Bay." *Wetlands* 24: 837-847.

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Dillaha, T. A., J. H. Sherrard, D. Lee, S. Mostaghimi, and V.O. Shanholtz. 1988. Evaluation of Vegetative Filter Strips as a Best Management Practice for Feed Lots." *Journal of the Water Pollution Control Federation* 60(7):1231-1238.

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Fischer, R. A. 2000. "Width of riparian zones for birds." *Ecosystem Management and Restoration Research Program Technical Notes Collection*, U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi. www.wes.army.mil/el/emrrp.

Houlahan, J.E. and C.S. Findlay. 2003. "The Effects of Adjacent Land Use on Wetland Amphibian Species Richness and Community Composition." *Canadian Journal of Fisheries and Aquatic Sciences* 60:1078-1094.

Kuusemets, V. and U. Mander 1999. "Ecotechnological Measures to Control Nutrient Losses from Catchments." *Water Science and Technology* 40(10): 195-202.

Cost Impact: Will not increase the cost of construction.

GG107-14: 402.3-GITLIN842

GG108-14

402.3, 402.4

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Delete without substitution:

~~**402.4 Wetland protection.** Buildings and building site improvements shall not be located within a wetland or within a buffer as established by the jurisdiction around a wetland.~~

~~**Exception:** Buildings and associated site improvements specifically related to the use of the wetland including, but not limited to, piers, docks, fish hatcheries, and habitat restoration facilities, shall be permitted where the impacts of the construction and location adjacent to or over the wetland on the habitat are mitigated.~~

~~**402.3 Surface water protection.** Where this section is indicated to be applicable in Table 302.1, buildings and building site improvements shall not be located over, or located within a buffer as established by the jurisdiction, around or adjacent to oceans, lakes, rivers, streams and other bodies of water that support or could support fish, recreation or industrial use. The buffer shall be measured from the ordinary high water mark of the body of water.~~

Exceptions:

- ~~1. Buildings and associated site improvements specifically related to the use of the water including, but not limited to, piers, docks, fish hatcheries, and habitat restoration facilities, shall be permitted where the impacts of the construction and location adjacent to or over the water on the habitat is mitigated.~~
- ~~2. Buildings and associated site improvements shall be permitted where a wetlands permit has been issued under a national wetlands permitting program or otherwise issued by the authority having jurisdiction.~~

Reason: These sections are unenforceable because no guidance is provided for establishment of the size of the "buffer" referred to in each section.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG108-14: 402.3-THOMPSON302

GG109-14

402.4

Proponent: Susan Gitlin, US Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov)

Revise as follows:

402.4 Wetland protection. Building and building site improvements shall not be located within a wetland or within a ~~buffer~~ buffer as established by the jurisdiction around the wetland. The width of the buffer shall be not less than the minimum buffer width shown in Table 402.4 or otherwise established by the jurisdiction.

Exception: Buildings and associated site improvements specifically related to the use of the wetland including, but not limited to, piers, docks, fish hatcheries, and habitat restoration facilities, shall be permitted where the impacts of the construction and location adjacent to or over the wetland on the habitat are mitigated.

TABLE 402.4(1)
WETLAND BUFFER WIDTHS*

<u>Wetland area (Acres)</u>	<u>Minimum buffer width (Feet)</u>
<u>< 5</u>	<u>50</u>
<u>5 to 30</u>	<u>75</u>
<u>> 30</u>	<u>100</u>

*For wetlands with surrounding slopes equal or greater to 10 percent but less than 15 percent, an additional 10 feet of buffer shall be added. For surface waters with surrounding slopes equal or greater than 15 percent but less than 20 percent, an additional 15 feet shall be added. For areas with surrounding slopes equal to or greater than 20 percent, an additional 30 feet shall be added.

Reason: Buffer” is defined in Chapter 2, but is not italicized in Chapter 4, so we recommend that this editorial correction be made. Section 402.4 requires that buildings and site improvements stay outside of a buffer area. The width (distance) of the buffer is left to be determined by the jurisdiction, which many jurisdictions could find burdensome. The default for the buffer distance is therefore effectively zero, which would be at odds with the intent of the section. This proposal presents a set of buffer distances that would serve as the default set of distances should the jurisdiction not be prepared to set the distances, or serve as guidance for a jurisdiction in its decision-making.

The distances provided in this table are based on scientific studies of the contributions of various-sized buffers to the protection of wetlands, as well as on studies of the approaches to setting buffer distances adopted in ordinances.

The proposed table calls for increased distances for wetlands located next to slopes of 10% or greater, as slopes are prone to increased erosion and runoff, both of which can damage water quality through increased loading of sediment and various pollutants. This reduces the ability of the water body to effectively filter pollutants and hurts its ecological productivity.

Bibliography:

DeLuca, W. V., C. E. Studds, and P. P. Marra. 2004. “The Influence of Land Use on the Integrity of Marsh Bird Communities of the Chesapeake Bay.” *Wetlands* 24: 837-847.

Dillaha, T.A., R.B. Reneau, S. Mostaghimi, and D. Lee. 1989. “Vegetative Filter Strips for Agricultural Nonpoint Source Pollution Control.” *Transactions of the ASAE* 32:513-519.

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Sheldon, D., T. Hruby, P. Johnson, K. Harper, A. McMillan, S. Stanley, and E. Stockdale. 2005. *Freshwater Wetlands in Washington State - Vol. 1: A Synthesis of the Science*. Washington Department of Ecology, Olympia.

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Wenger, S. 1999. *A Review of the Scientific Literature on Riparian Buffer Width, Extent, and Vegetation*. Available at www.rivercenter.uga.edu/service/tools/buffers/buffer_lit_review.pdf.

Cost Impact: Will not increase the cost of construction

GG109-14: 402.4-GITLIN845

GG110-14

402.6

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Delete without substitution:

~~402.6 Park land. Site disturbance or development of land located within a public park shall not be permitted.~~

Exceptions:

- ~~1. Buildings and site improvements shall be permitted to be located within a park where the building and site improvements serve a park-related purpose.~~
- ~~2. Park lands owned and managed by the Federal government shall be exempt from this prohibition.~~
- ~~3. Privately held property located within the established boundary of a park shall be exempt from this prohibition.~~

Reason: Section 402.6 has little value. Cities are not likely to allow people to develop in its parks. States and counties are going to control development in their parks and the Federal Interior Department will control development in its parks. The exception then says – well it's okay if it's for a park purpose.... The section has no impact on limiting the location of development. The second issue: compared to the other provisions of Section 402 – it is not a jurisdictional option –but mandatory for anyone adopting the code.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at:

<http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG110-14: 402.6-THOMPSON303

GG111-14

202, 402.8

Proponent: Susan Gitlin, U.S. Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov)

Delete without substitution:

SECTION 202 DEFINITIONS

~~**DIVERSE USE CATEGORIES.** Categories of occupancies and land uses which are designated as either community, retail or service facilities.~~

~~**Community facilities.** The community facilities category includes: child care; civic or community center; a building containing a place of worship; police or fire station; post office, public library, public park, school, senior care facility, homeless shelter, and similar social services facilities.~~

~~**Retail uses.** The retail use category includes: convenience store, florist, hardware store, pharmacy, grocery or supermarket and similar retail uses.~~

~~**Service uses.** The service use category includes: bank, coffee shop or restaurant; hair care; health club or fitness center; laundry or dry cleaner, medical or dental office and similar service uses.~~

Revise as follows:

402.8 Greenfield sites. Where this section is indicated to be applicable in Table 302.1, site disturbance or development shall not be permitted on *greenfield* sites.

Exception: The development of new buildings and associated site improvements shall be permitted on *greenfield* sites where the jurisdiction determines that adequate infrastructure exists, or will be provided, and where the sites comply with not less than one of the following:

1. The *greenfield* site is located within ¼ mile (0.4km) of developed residential land with an average density of not less than 8 dwelling units per acre (19.8 dwelling units per hectare).
2. The *greenfield* site is located within walkable proximity of neighborhood assets in accordance with ASTM WK31423. ~~¼ mile (0.4 km) distance, measured over roads or designated walking surfaces, of not less than 5 diverse uses and with ½ mile (0.8 km) walking distance of not less than 7 diverse uses. The diverse uses shall include not less than one use from each of the following categories of diverse uses; retail, service or community facility.~~
3. The *greenfield* site has access to transit service. The building on the building site shall be located in compliance with one of the following:

- 3.1. Within ¼ mile (0.4 km) distance, measured over designated walking surfaces of existing or planned bus or streetcar stops.
- 3.2. Within ½ mile (0.8 km) distance, measured over designated walking surfaces of existing or planned rapid transit stops, light or heavy passenger rail stations ferry terminals, or tram terminals.
4. The *greenfield* site is located adjacent to areas of existing development that have connectivity of not less than 90 intersections per square mile (35 intersections per square kilometer). Not less than 25 percent of the perimeter of the building site shall adjoin, or be directly across a street, public bikeway or pedestrian pathway from the qualifying area of existing development.
 - 4.1. Intersections included for determination of connectivity shall include the following:
 - 4.1.1. Intersections of public streets with other public streets;
 - 4.1.2. Intersections of public streets with bikeways and pedestrian pathways that are not part of a public street for motor vehicles; and
 - 4.1.3. Intersections of bikeways and pedestrian pathways that are not part of a public street for motor vehicles with other bikeways and pedestrian pathways that are not part of a public street for motor vehicles.
 - 4.2. The following areas need not be included in the determination of connectivity:
 - 4.2.1. Water bodies, including, but not limited to lakes and wetlands.
 - 4.2.2. Parks larger than ½ acre (2023 m²), designated conservation areas and areas preserved from development by the jurisdiction or by the state or federal government.
 - 4.2.3. Large facilities including, but not limited to airports, railroad yards, college and university campuses.

Add new standard(s) as follows:

ASTM

WK31423 New Specification for Standard Specification for Sustainably Siting A Building Relative to the Proximity to Public Transit

Reason: The *Standard Specification for Demonstrating that a Building's Site is in Proximity to Neighborhood Assets*, a product of the Building and Construction Subcommittee of ASTM's Sustainability Committee, provides a set of requirements for determining, measuring, and reporting whether a building is in sufficient proximity of neighborhood assets to allow occupants opportunity to walk to typical destinations. We recommend that the current language under item 2 of the Exception to 402.8 be amended to be based on the new standard, because:

1. The current IgCC language depends on the definition of "diverse use categories" in Section 202. That definition is not enforceable, as it leaves much up to the interpretation of the builder and code official. See, especially, the language at the end of each of the categories: "and similar social services facilities," "and similar retail uses," and "similar service uses." No criteria are provided to help define what is "similar," thus creating a vague definition that leaves the builder and code official in a tough spot. The proposal, which is based on the use of NAICS codes, would render the definition unnecessary and allow it to be deleted.
2. The ASTM standard requires that assets be within ½ mile of the building site, while IgCC currently requires that most assets be within ¼ mile to be counted. The longer distance adds flexibility that will increase the applicability to suburban and urban neighborhoods.
3. The minimum number of required assets for the ASTM standard is 6, or 4 with a grocery store, whereas IgCC currently requires a minimum of 7 assets. The lower bar will further increase the applicability of the requirement to more types of neighborhoods.
4. The ASTM standard adds precision to the measurement of distance between the building site and assets requirements that add precision to the measurement and documentation processes.

The terms "neighborhood assets," "diverse uses," and "community services" are used interchangeably in green building and urban planning writings and initiatives. "Neighborhood assets" is offered here as a replacement for the term currently used in IGCC (i.e., "diverse uses"), both because it is the term used in the ASTM standard and because it may be "neighborhood assets" clearer to a non-urban planning audience.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM WK31423 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG111-14: 402.8 #1-GITLIN823

GG112-14

202, 402.8

Proponent: Susan Gitlin, U.S. Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov)

SECTION 202 DEFINITIONS

Delete without substitution:

SECTION 202 DEFINITIONS

~~**RANSIT SERVICE.** A service that a public transit agency serving the area has committed to provide including, but not limited to, bus, streetcar, light or heavy rail, passenger ferry or tram service.~~

Revise as follows:

402.8 Greenfield sites. Where this section is indicated to be applicable in Table 302.1, site disturbance or development shall not be permitted on *greenfield* sites.

Exception: The development of new buildings and associated site improvements shall be permitted on *greenfield* sites where the jurisdiction determines that adequate infrastructure exists, or will be provided, and where the sites comply with not less than one of the following:

1. The *greenfield* site is located within 1/4 mile (0.4 km) of developed residential land with an average density of not less than 8 dwelling units per acre (19.8 dwelling units per hectare).
2. The *greenfield* site is located within 1/4 mile (0.4 km) distance, measured over roads or designated walking surfaces, of not less than 5 diverse uses and within 1/2 mile (0.8 km) walking distance of not less than 7 diverse uses. The diverse uses shall include not less than one use from each of the following categories of diverse uses: retail, service, or community facility.
3. The *greenfield* site is located in proximity to public transit in accordance with ASTM WK31430, has access to transit service. The building on the building site shall be located in compliance with one of the following:
 - 3.1. ~~Within 1/4 mile (0.4 km) distance, measured over designated walking surfaces, of existing or planned bus or streetcar stops.~~
 - 3.2. ~~Within 1/2 mile (0.8 km) distance, measured over designated walking surfaces, of existing or planned rapid transit stops, light or heavy passenger rail stations, ferry terminals, or tram terminals.~~
4. The *greenfield* site is located adjacent to areas of existing development that have connectivity of not less than 90 intersections per square mile (35 intersections per square kilometer). Not less than 25 percent of the perimeter of the building site shall adjoin, or be directly across a street, public bikeway or pedestrian pathway from the qualifying area of existing development.
 - 4.1 Intersections included for determination of connectivity shall include the following:
 - 4.1.1. Intersections of public streets with other public streets;
 - 4.1.2. Intersections of public streets with bikeways and pedestrian pathways that are not part of a public street for motor vehicles; and
 - 4.1.3. Intersections of bikeways and pedestrian pathways that are not part of a public street for motor vehicles with other bikeways and pedestrian pathways that are not part of a public street for motor vehicles.
 - 4.2. The following areas need not be included in the determination of connectivity:
 - 4.2.1. Water bodies, including, but not limited to lakes and wetlands.

- 4.2.2. Parks larger than 1/2 acre (2023 m2), designated conservation areas and areas preserved from development by the jurisdiction or by the state or federal government.
- 4.2.3. Large facilities including, but not limited to airports, railroad yards, college and university campuses.

Add new standard(s) as follows:

ASTM

WK31430 New Specification for Standard Specification for Sustainably Siting A Building Relative to the Proximity to Public Transit

Reason: The *Standard Specification for Demonstrating that a Building's Site Provides Access to Public Transit*, a product of the Building and Construction Subcommittee of ASTM's Sustainability Committee, provides a set of requirements for determining, measuring, and reporting that a building is in sufficient proximity of neighborhood assets to provide occupants the opportunity to take public transit to places of employment and to run errands. We recommend that the current language under item 3 of the Exception to 402.8 be amended to be based on the new standard, because:

1. The provisions currently in IGCC do not require any consideration of the frequency of transit service. The current provisions call only for the existence – or planned existence – of a transit stop. Actual availability, as well as the frequency, of service are essential to the use of public transit as a means of transportation. The likelihood that someone will take public transit to get to work is dependent on a number of variables that define the *quality* of the service, including service reliability, frequency of the service, and number of stops on the route. Higher quality also increases the distances that people are willing to walk to get to a stop. IGCC does consider differences in service reliability and number of stops through its differentiation of distances to stops for different types of services (e.g., bus vs. light rail). However, frequency of service is not considered. This is a fatal flaw, as frequency is an essential consideration in people's use of public transit for commuting purposes. In the ASTM standard, frequency of service is an integral component of the assessment of the availability of public transit to building occupants.
2. The measurement and documentation requirements in the ASTM standard would add both precision and alternatives to the requirements now in IGCC.
3. The ASTM standard allows for a greater range of transportation types than does IGCC. The ASTM standard contains a definition for "public transit" that is similar to, yet more precise, than the definition included in the current IGCC language. We propose that it be deleted in favor of the definition used in the ASTM standard, particularly in consideration of the fact that the term "transit service" is not used to any other IGCC provisions.

Cost Impact: Will not increase the cost of construction.

GG112-14: 402.8 #2-GITLIN825

GG113-14

402.8

Proponent: Mark Nowak, representing Steel Framing Alliance

Revise as follows:

402.8 Greenfield sites. Where this section is indicated to be applicable in Table 302.1, site disturbance or development shall not be permitted on *greenfield* sites.

Exception: The development of new buildings and associated site improvements shall be permitted on *greenfield* sites where the jurisdiction determines that adequate infrastructure exists, or will be provided, and where the sites comply with not less than one of the following:

1. The *greenfield* site is located within 1/4 mile (0.4 km) of developed residential land with an average density of not less than 8 dwelling units per acre (19.8 dwelling units per hectare).
2. The *greenfield* site is located within 1/4 mile (0.4 km) distance, measured over roads or designated walking surfaces, of not less than 5 diverse uses and within 1/2 mile (0.8 km) walking distance of not less than 7 diverse uses. The diverse uses shall include not less than one use from each of the following categories of diverse uses: retail, service, or community facility.
3. The *greenfield* site has access to transit service. The building on the building site shall be located in compliance with one of the following:
 1. Within 1/4 mile (0.4 km) distance, measured over designated walking surfaces, of existing or planned bus or streetcar stops.
 2. Within 1/2 mile (0.8 km) distance, measured over designated walking surfaces, of existing or planned rapid transit stops, light or heavy passenger rail stations, ferry terminals, or tram terminals.
4. The *greenfield* site is located adjacent to areas of existing development that have connectivity of not less than 90 intersections per square mile (35 intersections per square kilometer). Not less than 25 percent of the perimeter of the building site shall adjoin, or be directly across a street, public bikeway or pedestrian pathway from the qualifying area of existing development.
 1. Intersections included for determination of connectivity shall include the following:
 1. Intersections of public streets with other public streets;
 2. Intersections of public streets with bikeways and pedestrian pathways that are not part of a public street for motor vehicles; and
 3. Intersections of bikeways and pedestrian pathways that are not part of a public street for motor vehicles with other bikeways and pedestrian pathways that are not part of a public street for motor vehicles.
 2. The following areas need not be included in the determination of connectivity:
 1. Water bodies, including, but not limited to lakes and wetlands.
 2. Parks larger than 1/2 acre (2023 m²), designated conservation areas and areas preserved from development by the jurisdiction or by the state or federal government.
 3. Large facilities including, but not limited to airports, railroad yards, college and university campuses.
5. The *greenfield* site is located within 1/2 mi (800 m) of a major highway interchange and the buildings primary purpose is to provide basic services to travelers including, but not limited to, hotels, motels, and restaurant facilities.
6. Educational and other campus settings.

Reason: The current text would prohibit construction on sites on large campus settings. Often these types of settings are designed to encourage walking within the campus, but because of their size, would not meet the Greenfield exceptions currently in the code, forcing them to build elsewhere and requiring transportation to another

site that meets the Greenfield exceptions. The current text also would prohibit services along highways that are critical to travelers. This would force travelers to drive even further into the nearest town for gas, food, or lodging. The code should not require practices that will increase the miles traveled as the current text would. This proposal will provide appropriate exceptions to permit more efficient development.

Cost Impact: Will not increase the cost of construction.

GG113-14: 402.8-NOWAK339

GG114-14

402.8

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

402.8 Greenfield sites. Where this section is indicated to be applicable in Table 302.1, site disturbance or development shall not be permitted on greenfield sites.

Exception: The development of new buildings and associated site improvements shall be permitted on greenfield sites where the jurisdiction determines that adequate infrastructure exists, or will be provided, and where the sites comply with not less than one of the following:

1. The *greenfield* site is located within 1/4 mile (0.4 km) of developed residential land with an average density of not less than 8 dwelling units per acre (19.8 dwelling units per hectare).
2. The *greenfield* site is located within 1/4 mile (0.4 km) distance, measured over roads or designated walking surfaces, of not less than 5 diverse uses and within 1/2 mile (0.8 km) walking distance of not less than 7 diverse uses. The diverse uses shall include not less than one use from each of the following categories of diverse uses: retail, service, or community facility.
3. The *greenfield* site has access to transit service. The building on the building site shall be located in compliance with one of the following:
 - 3.1. Within 1/4 mile (0.4 km) distance, measured over designated walking surfaces, of existing or planned bus or streetcar stops.
 - 3.2. Within 1/2 mile (0.8 km) distance, measured over designated walking surfaces, of existing or planned rapid transit stops, light or heavy passenger rail stations, ferry terminals, or tram terminals.
4. The *greenfield* site is located adjacent to areas of existing development that have connectivity of not less than 90 intersections per square mile (35 intersections per square kilometer). ~~Not less than 25 percent of the perimeter of the building site shall adjoin, or be directly across a street, public bikeway or pedestrian pathway from the qualifying area of existing development.~~
 - 4.1. Intersections included for determination of connectivity shall include the following:
 - 4.1.1 Intersections of public streets with other public streets;
 - 4.1.2. Intersections of public streets with bikeways and pedestrian pathways that are not part of a public street for motor vehicles; and
 - 4.1.3. Intersections of bikeways and pedestrian pathways that are not part of a public street for motor vehicles with other bikeways and pedestrian pathways that are not part of a public street for motor vehicles.
 - 4.2. ~~The following areas need not be included in the determination of connectivity:~~
 - 4.2.1. ~~Water bodies, including, but not limited to lakes and wetlands.~~

~~4.2.2. Parks larger than 1/2 acre (2023m²), designated conservation areas and areas preserved from development by the jurisdiction or by the state or federal government.~~

~~4.2.3. Large facilities including, but not limited to airports, railroad yards, college and university campuses.~~

5. Not less than 25 percent of the perimeter of the *greenfield* site shall adjoin, or be directly across at street, public bikeway or pedestrian pathway from the qualifying area of existing development. The following areas need not be included in the determination of connectivity:

5.1. Water bodies, including, but not limited to lakes and wetlands.

5.2. Parks larger than 1/2 acre (2023m²) designated conservation areas and areas preserved from development by the jurisdiction or by the state or federal government.

5.3. Large facilities including, but not limited to airports, railroad yards, college and university campuses.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The fourth exception to Sec. 402.8 confuses location (distance to intersections) and geometry (common perimeters) such that a site that complies with the distance to intersections requirement can still fail to meet the exception because of site geometry even though it has adequate connectivity.

This proposal separates the location and geometry requirements to create an additional exception. This minor relaxation of stringency of the code is warranted to make the code more flexible.

Cost Impact: Will not increase the cost of construction.

GG114-14: 402.8-THOMPSON936

GG115-14

403.1

Proponent: Mike Fischer, Kellen Company, representing self
(mfischer@kellencompany.com)

Revise as follows:

403.1 Stormwater management. Stormwater management systems, including, but not limited to, infiltration, evapo- transpiration; vegetative roofing; rainwater harvest and runoff reuse; shall be provided and maintained on the building site.

Reason: Vegetative roofing is a proven stormwater management technique. Including it in the cited mitigation measures is appropriate.

Cost Impact: Will not increase the cost of construction.

GG115-14: 403.1-FISCHER1165

GG116-14

403.1.1, 403.1

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

403.1 Stormwater management. Stormwater management systems, including, but not limited to, infiltration, evapo-transpiration; rainwater harvest and runoff reuse; shall be provided and maintained on the building site. Post development runoff rate, volume, and duration shall not exceed predevelopment values. A hydrologic analysis of the building site shall be prepared by a registered design professional or other approved source.

Delete without substitution:

~~**403.1.1 Increased runoff.** Stormwater management systems shall address the increase in runoff that would occur resulting from development on the building site and shall either:~~

- ~~1. Manage rainfall onsite and size the management system to retain not less than the volume of a single storm which is equal to the 95th percentile rainfall event and all smaller storms and maintain the predevelopment natural runoff; or~~
- ~~2. Maintain or restore the predevelopment stable, natural runoff hydrology of the site throughout the development or redevelopment process. Postconstruction runoff rate, volume, and duration shall not exceed predevelopment rates. The stormwater management system design shall be based, in part, on a hydrologic analysis of the building site.~~

Reason: A simple statement of the measurable performance objective is easier for code users. Guidance is given re: who should be providing hydrologic analysis, but the requirement to do so for every site is relaxed in recognition of smaller or simpler sites. This is aligned with the building code's approach to requiring soils investigations and reports before construction.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG116-14: 403.1-THOMPSON359

GG117-14

202 (New), 403.1.1

Proponent: Karen Hobbs, Natural Resources Defense Council, representing Natural Resources Defense Council (khobbs@nrdc.org)

Add new definition as follows:

SECTION 202 DEFINITIONS

GREEN INFRASTRUCTURE. A soil- and vegetation-based approach to stormwater management that is cost-effective, sustainable and environmentally friendly. Green infrastructure management approaches and technologies infiltrate, evapotranspire, capture or reuse stormwater to maintain or restore natural hydrologies.

Revise as follows:

403.1.1 Increased runoff. Stormwater management systems, including the use of green infrastructure, shall address the increase in runoff that would occur resulting from development on the building site. ~~The stormwater system and shall either:~~ 1. manage rainfall onsite and size the management system to retain not less than the volume of a single storm that is equal to the 95th-percentile rainfall event and all smaller storms and ensure that runoff is not more than maintain the predevelopment natural runoff. ~~or~~

~~2. Maintain or restore the predevelopment stable, natural runoff hydrology of the site throughout the development or redevelopment process. Postconstruction runoff rate, volume, and duration shall not exceed predevelopment rates. The stormwater management system design shall be based, in part, on a hydrologic analysis of the building site.~~

Reason: The proposed change simplifies the code and clarifies the intent to provide on-site stormwater management. It also aligns the IgCC with LEED v. 4. The second clause is deleted for a number of reasons.

1. None of the terms are defined. What is predevelopment runoff refer to -- volume or rate or hydrograph?
2. Matching the predevelopment hydrology is not necessarily sufficient to adequately manage stormwater or protect water quality.

Having the same amount of runoff coming from a site post-development can result in more pollution, since there are more pollution sources on the developed site than in predevelopment condition. This is especially true for sites with relatively non-porous soils in predevelopment conditions.

The defined term GREEN INFRASTRUCTURE aligns with the definition of green infrastructure in LEED v. 4. This term must be defined to align with proposed changes to Chapter 4, stormwater management.

Bibliography:

U.S. EPA (2007). *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, p. iii, accessed at <http://www.epa.gov/owow/NPS/lid/costs07/documents/reducingstormwatercosts.pdf>.

"*Advocacy: Stormwater Case Studies*," (2011) American Society of Landscape Architects, accessed at <http://www.asla.org/ContentDetail.aspx?id=31301>.

Cost Impact: Will not increase the cost of construction. A 2007 U.S. EPA study found that "in the vast majority of cases [green infrastructure] practices save money for developers, property owners and communities while protecting and restoring water quality." The American Society of Landscape Architects released a survey in October 2011 that found green infrastructure reduced or did not influence costs 75 percent of the time.

GG117-14: 403.1.1-HOBBS1173

GG118-14

403.1.1

Proponent: Barry Greive, representing Target Corporation
(barry.greive@target.com)

Revise as follows:

403.1.1 Increased runoff. Stormwater management systems shall address the increase in runoff that would occur resulting from development on the building site and shall either:

1. Manage rainfall onsite and size the management system to retain not less than the volume of a single storm which is equal to the 95th-percentile rainfall event as recorded by the National Climatic Data Center or other *approved* precipitation records and all smaller storms and maintain the predevelopment natural runoff; or
2. Maintain or restore the predevelopment stable, natural runoff hydrology of the site throughout the development or redevelopment process. Postconstruction runoff rate, volume, and duration shall not exceed predevelopment rates. The stormwater management system design shall be based, in part, on a hydrologic analysis of the building site.

Reason: The portion that allows use of the 95th percentile rainfall event data is vague and does not give clear direction regarding where the data should come from, this change clarifies this for consistency and allows a designing engineer to have consistent data for their calculations. The NCDC is also recognized by the EPA.

Cost Impact: Will not increase the cost of construction.

GG118-14: 403.1.1-GREIVE1097

GG 119-14

403.1, 403.1.1, 403.1.2, 403.1.3, 403.2, 403, 403.1 (New), 403.1.1 (New), 403.1.2 (New), 403.1.3 (New)

Proponent: Craig Conner, Self, representing self (craig.conner@mac.com)

Delete and substitute as follows:

~~**403.1 Stormwater management.** Stormwater management systems, including, but not limited to, infiltration, evapo-transpiration, rainwater harvest and runoff reuse, shall be provided and maintained on the building site.~~

~~**403.1.1 Increased runoff.** Stormwater management systems shall address the increase in runoff that would occur resulting from development on the building site and shall either:~~

- ~~1. Manage rainfall onsite and size the management system to retain not less than the volume of a single storm which is equal to the 95th percentile rainfall event and all smaller storms and maintain the predevelopment natural runoff; or~~
- ~~2. Maintain or restore the predevelopment stable, natural runoff hydrology of the site throughout the development or redevelopment process. Postconstruction runoff rate, volume, and duration shall not exceed predevelopment rates. The stormwater management system design shall be based, in part, on a hydrologic analysis of the building site.~~

~~**403.1.2 Adjoining lots and property.** The stormwater management system shall not redirect or concentrate off-site discharge that would cause increased erosion or other drainage related damage to adjoining lots or public property.~~

~~**403.1.3 Brownfields.** Stormwater management systems on areas of *brownfields* where contamination is left in place shall not use infiltration. Stormwater management systems shall not penetrate, damage, or otherwise compromise remediation actions at the building site.~~

~~**403.2 Coal tar sealants.** Coal tar sealants shall not be used in any application exposed to stormwater, wash waters, condensates, snowmelt, icemelt or any source of water that could convey coal tar sealants into soils, surface waters or groundwaters.~~

~~**403.1 Stormwater management.** Stormwater management for the building *site or complex of building sites within the development* shall address the potential increase in runoff that would occur resulting from construction and shall either:~~

- ~~1. Manage rainfall on-site to retain, use or infiltrate at a minimum, the volume of a single storm that is equal to the 95th *percentile rainfall event*; or~~
- ~~2. Improve, maintain or restore the pre-development stable, runoff hydrology of the site in an approved manner. Runoff rate and volume shall not exceed predevelopment rates.~~

~~**403.1.1 Rainwater catchment.** Where allowed by the jurisdiction, rainwater catchment shall be permitted to be used as part of stormwater management.~~

~~**403.1.2 Site infiltration.** Infiltration into the site or development shall be permitted to be used as part of stormwater management. Site infiltration includes drainage of impermeable surfaces onto vegetated areas or permeable hardscapes.~~

~~**403.1.3 Adjoining lots.** The stormwater management system shall not cause increased erosion or other drainage related damage to adjoining *lots* or public property.~~

Reason: This modifies the storm water section.

Cost Impact: Will not increase the cost of construction

GG 119-14 : 403 (NEW)-CONNER1201

GG120-14

404.1, 404.11

Proponent: Karen Hobbs, representing Natural Resources Defense Council
(khobbs@nrdc.org)

Revise as follows:

404.1 Landscape irrigation systems. Landscapes shall be designed to limit or eliminate the use of potable water for irrigation. Irrigation of exterior landscaping shall comply with Sections 404.1.1 and 404.1.2.

404.1.1 Water for outdoor landscape irrigation. ~~Outdoor~~ Where provided, outdoor landscape irrigation systems shall be designed and installed to reduce potable water use by not less than 50 percent from a calculated mid-summer baseline in accordance with Section 404.1.2 or, where permitted by State regulation or local ordinances, the system shall be supplied by municipal reclaimed water or with *alternate onsite nonpotable water* complying with Chapter 7.

Exceptions: Potable water is permitted to be used as follows:

1. During the establishment phase of newly planted landscaping, not to exceed one year.
2. To irrigate food production.
3. To supplement nonpotable water irrigation of shade trees provided in accordance with Section 408.2.3.
4. Potable water is permitted for landscape irrigation where approved by local ordinance or regulation.

Reason: Research has shown that, on average, about half of the water used in a single-family American home during the course of a year will be for landscape irrigation. Irrigation systems should not drive landscape design; rather, landscape design should determine the best form of irrigation and, indeed, whether irrigation is needed. This proposed change aligns the IGCC with LEED v. 4, Land water use reduction.

Cost Impact: Will not increase the cost of construction.

GG120-14: 404.1-HOBBS1043

GG121-14

404.1.1, 404.1.1.1 (NEW)

Proponent: Kent Sovocool, representing Southern Nevada Water Authority
(kent.sovocool@snwa.com)

Revise as follows:

404.1.1 Water for outdoor landscape irrigation. Outdoor landscape irrigation systems shall be designed and installed to reduce potable water use by 50 percent from a calculated mid-summer baseline in accordance with Sections 404.1.1.1 and 404.1.2 or, where permitted by State regulation or local ordinances, the system shall be supplied by municipal reclaimed water or with *alternate onsite nonpotable water* complying with Chapter 7.

Exceptions: Potable water is permitted to be used as follows:

1. During the establishment phase of newly planted landscaping.
2. To irrigate food production.
3. To supplement nonpotable water irrigation of shade trees provided in accordance with Section 408.2.3.
4. Potable water is permitted for landscape irrigation where approved by local ordinance or regulation.

Add new text as follows:

404.1.1.1 Mid-summer baseline calculation.

The mid-summer baseline or theoretical peak water demand of a site shall be calculated as follows:

$$\frac{MSB}{ILA} = (ED - P) \times PFT \times 1.6 \times$$

Equation 4-1

where:

MSB = The mid-summer baseline in gallons.

ED = The estimated peak demand month's average reference evapotranspiration demand in inches.

P = The estimated peak demand month's estimated average precipitation in inches.

PFT = The plant factor for turfgrass in accordance with ASABE S623 using cool or warm season turfgrass, whichever is most common to the region. Where the most common turfgrass type is unknown the average of the values for cool and warm season turfgrasses shall be used.

ILA = The installed landscaped area in square feet assuming 100 percent coverage with turfgrass.

Add new standard(s) as follows:

ASABE

ANSI/ASABE S623-XXXX Determining Landscape Plant Water Requirements

Reason: Section 404.1.1 states that irrigation systems must be designed and installed to reduce potable water use 50 percent from a “calculated mid-summer baseline” but gives no guidance as to how this is to be accomplished. The proposal gives clear directions for calculation of this baseline drawing on plant factors developed from an ANSI standard. This assures the intent and integrity of the code is met and allows the *authority having jurisdiction* to verify the requisite baseline without detailed knowledge of water use for individual plants in their area.

The ANSI ASABE S623 standard is in development and should be available by Dec 1, 2014.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ANSI/ASABE S623-XXXX with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG121-14: 404.1.1-SOVOCOOL924

GG122-14

404.1.2

Proponent: Timothy Malooly, representing Water in Motion, Inc.
(timm@watermotion.com)

Revise as follows:

404.1.2 Irrigation system design and installation. Where in-ground irrigation systems are provided, the systems shall comply with all of the following:

1. The design and installation of outdoor irrigation systems shall be under the supervision of an irrigation professional accredited or certified by an appropriate local or national body.
2. Landscape irrigation systems shall not direct water onto building exterior surfaces, foundations or exterior paved surfaces. Systems shall not generate runoff.
3. Where an irrigation control system is used, the system shall be one that regulates irrigation based on weather, climatological or soil moisture status data. The controller shall have integrated or separate sensors to suspend irrigation events during rainfall.
4. Irrigation zones shall be based on plant water needs with plants of similar need grouped together. Turfgrass shall not be grouped with other plantings on the same zone.
5. Microirrigation zones shall be equipped with pressure regulators that ensure zone pressure is not greater than 40 psi (275.8 kPa), filters, and flush end assemblies.
6. Landscape sprinklers and emitters shall be listed and labeled to ASABE/ICC 802.
7. Sprinklers shall:
 1. Have nozzles with matched precipitation rates.
 2. Be prohibited on landscape areas less than 4 feet (1230 mm) in any dimension.
 3. Be prohibited on slopes greater than 1 unit vertical to 4 units horizontal (25- percent slope). Be permitted for use on turfgrass and crop areas only excepting microsprays of a flow less than 45 gallons (170 liters) per hour.

Exception: Where the application rate of the sprinklers is less than or equal to 0.5 inches (12.7 mm) per hour.

4. If of the pop-up configuration, pop-up to a height of not less than 4 inches (101 mm).
5. Only be installed in zones composed exclusively of sprinklers and shall be designed to achieve a lower quarter distribution uniformity of not less than 0.65.

Add new standard(s) as follows:

ASABE

ASABE/ICC 802-XXXX Landscape Irrigation Sprinkler and Emitter Standard

Reason:

I've requested addition of one call out to section 404.1.2. The new callout is numbered 6 and the former number 6 is moved to number 7. The new call out is "Landscape sprinklers and emitters shall be listed and labeled to ASABE/ICC 802".

The primary reason to add this call out is that ASABE in partnership with ICC have completed a standard for landscape sprinklers and emitters (ASABE/ICC 802). This standard should be added to the 2015 IgCC. Adding this call out will:

- * enable easier and improved selection process of landscape irrigation components when designing and specifying landscape irrigation systems
- * result in better compliance by installers of the goals and expectations of the design, specification and overall intent of projects undertaken within the IgCC
- * result in improved design and performance of landscape irrigation systems included in projects undertaken within the IgCC

* furnish inspect-able elements of a project undertaken within the IgCC related to landscape irrigation system installation

* result in enhanced safety and reliability of landscape irrigation system performance

* enable guidance of practitioners to include such listed and labeled equipment replacements or additions when undertaking landscape irrigation maintenance or retrofit events following a project undertaken within the IgCC.

The location of the proposed addition is consistent with the topics and text of the existing chapter and seems to be the most appropriate place to add the call out within the current structure and format of the IgCC.

Cost Impact: Will increase the cost of construction. Including the call out requested herein is estimated to increase the cost of construction of a landscape irrigation system on a property between 1% (one percent) and 3% (three percent) depending on several variables.

However, when calculating total cost of ownership and enhanced safety and reliability of system performance, the increased cost is likely to result in a payback period of one to three years.

Analysis: A review of the standard proposed for inclusion in the code, ASABE/ICC 802-XXXX with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG122-14: 404.1.2-MALLOOLY1060

GG123-14

404.1.2

Proponent: Brent Mecham, representing Irrigation Association
(brentmecham@irrigation.org)

Revise as follows:

404.1.2 Irrigation system design and installation. Where in-ground irrigation systems are provided, the systems shall comply with all of the following:

1. The design and installation of outdoor irrigation systems shall be under the supervision of an irrigation professional accredited or certified by an appropriate local or national body.
2. Landscape irrigation systems shall not direct water onto building exterior surfaces, foundations or exterior paved surfaces. Systems shall not generate runoff.
3. Where an irrigation control system is used, the system shall be one that regulates irrigation based on weather, climatological or soil moisture status data. The controller shall have integrated or separate sensors to suspend irrigation events during rainfall.
4. Irrigation zones shall be based on plant water needs with plants of similar need grouped together. Turfgrass shall not be grouped with other plantings on the same zone.
5. Microirrigation zones shall be equipped with pressure regulators that ensure zone pressure is not greater than 40 psi (275.8 kPa) appropriate for the emission devices, filters, and flush end assemblies.
6. Sprinklers shall:
 - 6.1 Comply with ASABE/ICC 802. Have nozzles with matched precipitation rates.
 - 6.2 Be prohibited on landscape areas less than 4 feet (1230 mm) in any dimension.
 - 6.3 Be prohibited on slopes greater than 1 unit vertical to 4 units horizontal (25- percent slope).

Exception: Where the application rate of the sprinklers is less than or equal to 0.50.65 inches (12.719.1 mm) per hour.

 - 6.4 Be permitted for use on turfgrass, ground cover areas less than 12 inches (300 mm) tall at mature height and crop areas only excepting microsprays of a flow less than 4530 gallons (170113.3 liters) per hour.
 - 6.5 If of the pop-up configuration, shall have a pop-up to a height of not less than 4 inches (101 mm).
 - 6.6 Only be installed in zones composed exclusively of sprinklers and shall be designed to achieve a lower quarter distribution uniformity of not less than 0.65. shall have matched precipitation rates within each zone.
7. Microirrigation emission devices shall:
 - 7.1 Comply with ASABE/ICC 802
 - 7.2 Be pressure compensating where they are drip emitters.

Add new standard(s) as follows:

ASABE

ASABE/ICC 802-201X Landscape Irrigation Sprinkler and Emitter Standard.

Reason: Draft 2 of the Landscape Sprinkler and Emitter standard is due for public release soon and hopefully the committee will have a final version by the time of the hearing meetings in late April.

Proposed changes to this section is to reflect provisions and consistency with the proposed Landscape Sprinkler and Emitter standard.

Item 5 is to remove the maximum pressure requirement so that design professionals will not be artificially constrained on the correct pressure needed for proper operation of a drip system. The inclusion in 6.7 that emitters be pressure compensating will help ensure proper delivery of water. This is especially important on very large systems where 40 psi would be limiting to proper hydraulics for efficient operation.

Item 6.1 is changed to reference that sprinklers and emitters comply with proposed standard. The current provision of 6.1 was added to 6.6.

Item 6.3 by increasing the application rate to 0.65 inches per hour allows the designer a wider product selection so that the irrigation can be designed more efficiently and take advantage of many new innovative nozzles and sprinklers. Current provision favors a limited product choice. Additionally, since the irrigation control system has to be one that uses advance technology and inputs to create proper schedules including cycle and soak which helps mitigate runoff as well as the lower precipitation rate.

Item 6.4 is modified so that extensive low-growing ground cover areas could be irrigated with sprinklers instead of drip emitters at the discretion of the irrigation designer. The goal is to deliver water the most efficiently and also to minimize the amount of piping etc. required to irrigate a space which is a more sustainable approach. The sprinkler pop-up height would need to be sufficient to clear the vegetation for proper delivery and since the maximum popup height of sprinklers is twelve inches, that is why the maximum mature height of the plantings is twelve inches in the provision.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASABE/ICC 802-201X with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG123-14 : 404.1.2-MECHAM715

GG124-14

404.1.2

Proponent: Richard Miller, representing FLSS IAFC (rmiller@iafc.org)

Revise as follows:

404.1.2 Irrigation system design and installation. Where in-ground irrigation systems are provided, the systems shall comply with all of the following:

1. The design and installation of outdoor irrigation systems shall be under the supervision of an irrigation professional accredited or certified by an appropriate local or national body.
2. Landscape irrigation systems shall not direct water onto building exterior surfaces, foundations or exterior paved surfaces. Systems shall not generate runoff.
3. Where an irrigation control system is used, the system shall be one that regulates irrigation based on weather, climatological or soil moisture status data. The controller shall have integrated or separate sensors to suspend irrigation events during rainfall.
4. Irrigation zones shall be based on plant water needs with plants of similar need grouped together. Turfgrass shall not be grouped with other plantings on the same zone.
5. Microirrigation zones shall be equipped with pressure regulators that ensure zone pressure is not greater than 40 psi (275.8 kPa), filters, and flush end assemblies.
6. Irrigation sprinklers shall:
 1. Have nozzles with matched precipitation rates.
 2. Be prohibited on landscape areas less than 4 feet (1230 mm) in any dimension.
 3. Be prohibited on slopes greater than 1 unit vertical to 4 units horizontal (25-percent slope).

Exception: Where the application rate of the irrigation sprinklers is less than or equal to 0.5 inches (12.7 mm) per hour.

4. Be permitted for use on turfgrass and crop areas only excepting microsprays of a flow less than 45 gallons (170 liters) per hour.
5. If of the pop-up configuration, pop-up to a height of not less than 4 inches (101 mm).
6. Only be installed in zones composed exclusively of irrigation sprinklers and shall be designed to achieve a lower quarter distribution uniformity of not less than 0.65.

Reason: There are two different sprinklers referenced in the IgCC, irrigation and fire. Fire sprinklers are defined in the IBC, "Irrigation" is correct terminology for sprinklers used in landscaping/lawn irrigation.

"This proposal is approved by the Fire-CAC, but not reviewed by the SEHP-CAC"

Cost Impact: Will not increase the cost of construction.

GG124-14: 404.1.2-MILLER443

GG125-14

404.1.2

Proponent: Ed Osann, representing Natural Resources Defense Council (eosann@nrdc.org)

Revise as follows:

404.1.2 Irrigation system design and installation. Where in-ground irrigation systems are provided, the systems shall comply with all of the following:

1. The design and installation of outdoor irrigation systems shall be under the supervision of an irrigation professional accredited or certified by an appropriate local or national body.
2. Landscape irrigation systems shall not direct water onto building exterior surfaces, foundations, ~~or exterior paved surfaces, or adjoining lots.~~ Systems shall not generate runoff.
3. Where an irrigation control system is used, the system shall be one that regulates irrigation based on weather, climatological or soil moisture status data. The controller shall have integrated or separate sensors to suspend irrigation events during rainfall.
4. Irrigation zones shall be based on plant water needs with plants of similar need grouped together.
Turfgrass shall not be grouped with other plantings on the same zone.
5. Microirrigation zones shall be equipped with pressure regulators that ensure zone pressure is not greater than 40 psi (275.8 kPa), filters, and flush end assemblies.
6. Sprinklers shall:
 1. Have nozzles with matched precipitation rates.
 2. Be prohibited on landscape areas less than 4 feet (1230 mm) in any dimension.
 3. Be prohibited on slopes greater than 1 unit vertical to 4 units horizontal (25-percent slope).

Exception: Where the application rate of the sprinklers is less than or equal to 0.5 inches (12.7 mm) per hour.

4. Be permitted for use on turfgrass and crop areas only excepting microsprays of a flow less than 45 gallons (170 liters) per hour.
5. If of the pop-up configuration, pop-up to a height of not less than 4 inches (101 mm).
6. Only be installed in zones composed exclusively of sprinklers and shall be designed to achieve a lower quarter distribution uniformity of not less than 0.65.

Reason: Irrigation systems should be designed and installed to confine the application of water to intentionally targeted areas only. The list of precluded applications in subparagraph 2 of Section 404.1.2 should also include the direction of irrigation water across a lot line onto adjoining properties.

Cost Impact: Will not increase the cost of construction. Compliance can be achieved with good system design without cost impact.

GG125-14: 404.1.2-OSANN34

GG126-14

404.1.2

Proponent: Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov)

Revise as follows:

404.1.2 Irrigation system design and installation. Where in-ground irrigation systems are provided, the systems shall comply with all of the following:

1. The design and installation of outdoor irrigation systems shall be under the supervision of an irrigation professional accredited or certified by an appropriate local or national body.
2. Landscape irrigation systems shall not direct water onto building exterior surfaces, foundations or exterior paved surfaces. Systems shall not generate runoff or overspray .
3. Where an irrigation control system is used, the system shall be one that regulates irrigation based on weather, climatological or soil moisture status data. The controller shall have integrated or separate sensors to suspend irrigation events during rainfall.
4. Irrigation zones shall be based on plant water needs with plants of similar need grouped together. Turfgrass shall not be grouped with other plantings on the same zone.
5. Microirrigation zones shall be equipped with pressure regulators in accordance with manufacturer's specifications that ensure zone pressure is not greater than 40 psi (275.8 kPa), filters, and flush end assemblies.
6. All required technologies shall be WaterSense labeled where the WaterSense label is available.

Exception: Centrally controlled in-ground irrigation systems using weather or soil moisture to automatically adjust irrigation run-times.

7. ~~6. Automatic in-ground irrigation systems~~ Sprinklers shall include the following:
 1. ~~6.4 Drip, micro-irrigation, and spray heads~~ Have nozzles with matched precipitation rates within each zone. 6.2 Be prohibited on landscape areas less than 4 feet (1230 mm) in any dimension. 6.3 Be prohibited on slopes greater than 1 unit vertical to 4 units horizontal (25-percent slope).

Exception: Where the application rate of the sprinklers is less than or equal to 0.5 inches (12.7 mm) per hour. ~~6.4 Be permitted for use on turfgrass and crop areas only excepting microsprays of a flow less than 45 gallons (170 liters) per hour.~~

2. ~~6.5~~ If of the pop-up configuration, pop-up to a height of not less than 4 inches (101mm).
3. ~~6.6 Only be installed in zones composed exclusively of s~~ Sprinklers and shall be designed to achieve a lower quarter distribution uniformity of not less than 0.65.
4. Low precipitation rate, high distribution uniformity rotary nozzles for spray heads.
5. A mainline master valve or a combination of a master valve and pressure regulator.
6. Sprinkler heads with internal check valves.

Reason: The intent of this proposal is to continue to increase the efficiency of the irrigation system, by specifying the use of watersense where available, eliminating overspray, adding checkvalves, and the such. The proposal also addresses more effective design by matching precipitation rates by zone instead of one rate for all heads. Amidst conservation, we must also be mindful that we do not lose beauty, so the prohibition for use on areas less than 4 feet in any dimension was deleted, because many beautiful landscapes can happen in small places. Item 6.4 was deleted due to that we are hoping the original proponent will revise it this code cycle, however, it can be deleted now if they do not.

Cost Impact: Will not increase the cost of construction.

GG126-14: 404.1.2-PETRIE1151

GG127-14

404.1.2

Proponent: Kent Sovocool, representing Southern Nevada Water Authority
(kent.sovocool@snwa.com)

Revise as follows:

404.1.2 Irrigation system design and installation. Where in-ground irrigation systems are provided, the systems shall comply with all of the following:

1. The design and installation of outdoor irrigation systems shall be under the supervision of an irrigation professional accredited or certified by an appropriate local or national body.
2. Landscape irrigation systems shall not direct water onto building exterior surfaces, foundations or exterior paved surfaces. Systems shall not generate runoff.
3. Where an irrigation control system is used, the system shall be one that regulates irrigation based on weather, climatological or soil moisture status data. The controller shall have integrated or separate sensors to suspend irrigation events during rainfall.
4. Irrigation zones shall be based on plant water needs with plants of similar need grouped together.
Turfgrass shall not be grouped with other plantings on the same zone.
5. Microirrigation zones shall be equipped with pressure regulators that ensure zone pressure is not greater than 40 psi (275.8 kPa), filters, and flush end assemblies.
6. Sprinklers shall:
 1. Have nozzles with matched precipitation rates.
 2. Be prohibited on landscape areas less than 4 feet (1230 mm) in any dimension.
 3. Be prohibited on slopes greater than 1 unit vertical to 4 units horizontal (25-percent slope).

Exception: Where the application rate of the sprinklers is less than or equal to 0.5 inches (12.7 mm) per hour.

4. Be permitted for use on turfgrass and crop areas only excepting microsprays of a flow less than 45 gallons (170 liters) per hour.
5. If of the pop-up configuration, pop-up to a height of not less than 4 inches (101 mm).
6. Only be installed in zones composed exclusively of sprinklers and shall be designed to achieve a lower quarter distribution uniformity of not less than 0.65.
7. Water emission devices and sprinklers shall comply with ASABE/ICC 802 where the components to be installed are of classes of applicable products that are covered by ASABE/ICC 802.

Add new standard(s) as follows:

ASABE

ASABE/ICC 802-201X Landscape Irrigation Sprinkler and Emitter Standard

Reason: The ASABE/ICC Landscape Irrigation Sprinkler and Emitter Standard has been developed to assure minimum performance, safety, and marking requirements for landscape irrigation emission devices and sprinklers. It is important and reasonable to incorporate a requirement that these types of products meet this standard.

The Standard is almost complete and should be ready by Dec, 1, 2014. The current draft of the ASABE/ICC 802-201X can be viewed at:

<http://www.iccsafe.org/cs/standards/IS-IEDC/Documents/DraftDocuments/LandscapeIrrigationSprinklerEmitterStandard-Draft4.pdf>

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, ASABE/ICC 802-201X, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG127-14 : 404.1.2-SOVOCOOL740

GG128-14

404.2.1

Proponent: Maureen Traxler, representing City of Seattle Dept. of Planning & Development
(maureen.traxler@seattle.gov)

Revise as follows:

404.2.1 Treatment. The treatment required to maintain appropriate water quality shall ~~comply with~~
be determined by the authority having jurisdiction.

Reason: This proposal corrects the choice of words in this section. It is possible to “comply with” Codes and rules, not with a person.

Cost Impact: Will not increase the cost of construction.

GG128-14: 404.2.1-TRAXLER480

GG129-14

202, 405.1.3

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Delete without substitution:

SECTION 202 DEFINITIONS

~~FARMLAND.~~

~~**Farmlands of statewide significance.** Land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage and oil seed crops. Criteria for delineating this land is determined by the appropriate state agency.~~

~~**Prime farmland.** Land that has the best combination of physical and chemical characteristics for producing food, fiber, feed, forage, and oil seed crops and that is also available for these uses, including cropland, pastureland, forest land, range land and similar lands which are not water areas or urban or built-up land areas.~~

~~**Unique farmland.** Land other than prime farmland that is used for the production of specific high-value food or fiber crops. The land has the special combination of soil quality, location, growing season and moisture supply needed to economically produce sustained high-quality crops or high yields of a specific crop where the lands are treated and managed according to acceptable farming methods.~~

Revise as follows:

405.1.3 Imported soils. Topsoils or soil blends imported to a building site to serve as topsoil shall not be mined from the following locations:

1. Sites that are identified as prime farmland, unique farmland, or farmland of statewide importance by the USDA Natural Resources Conservation Service soil survey.
2. *Greenfield* sites where development is prohibited by Section 402.8.

Exception: Soils shall be permitted to be imported from the locations in Items 1 and 2 where those soils are a byproduct of a building and building site development process provided that imported soils are reused for functions comparable to their original function.

Reason: This proposal is a clarification. Currently the code uses language borrowed from the USDA's Natural Resources Conservation Service soil survey program to define farmlands of statewide significance, prime farmland, or unique farmland. These definitions were not designed to serve a regulatory function and contain subjective language.

Additionally, a user of the code does not really need to know how to define these farmlands, they merely need to know whether the land in question has already been defined under the NRCS soils survey program as any one of the three of the farmlands of interest in order to apply Section 405.1.3.

The proposed change eliminates needless and subjective verbiage while providing superior useability; owners, designers, and code officials merely have to access the applicable soil survey area to verify the status of the soil in question. <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

As the term is only used in Section 405.1.3, the SEHPCAC felt that it was best to incorporate the definition directly within that section.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the

SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG129-14: 405.1.3-THOMPSON358

GG130-14

405.1.4

Proponent: Brenda Thompson, representing SEHPCAC

Revise as follows:

405.1.4 Soil reuse and restoration. Soils that are being placed ~~or replaced~~ on a building site shall be prepared, ~~amended~~ and placed in a manner that establishes ~~or restores~~ the ability of the soil to support the vegetation ~~that has been protected~~ and that will be planted. Soil reuse and restoration shall be in accordance with Sections 405.1.4.1 and 405.1.4.2.

Reason: It does not make a difference if the soil originated on the site or not; use of the word “replace” in this section does not add meaning or trigger a specific requirement. “Amending” the soil is part of preparing it. There is no need to mention it separately. If soils are being placed, it implies there is no vegetation being protected in place. Vegetation protected in place should already have acceptable soil.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG130-14: 405.1.4-THOMPSON739

GG131-14

405.1.4.3 (New)

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Add new text as follows:

405.1.4.3 (New)Reference soil. A soil sample or description shall be used as the reference soil for soil restoration in accordance with Section 405.1.4.2. One or more of the following shall be used as the basis for reference soils for the site:

1. Soils characteristic of a site as described in Natural Resources Conservation Service soil surveys where mapped.
2. Undisturbed soils on the site.
3. Undisturbed soils within the site's Natural Resources Conservation Service soil survey area that have vegetation, topography, or soil structure similar to the site.
4. For sites that have no existing soil, soils within the site's Natural Resources Conservation Service soil survey area that support species of vegetation intended to be used in the building project.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The term "reference soil" is used throughout Section 405.1.4.2, Restoration, to identify the design objective of for soils placed, or restored on site. The section does not work without a definition for reference soil. "Reference soil is also used in the definition of CONSTRUCTION-COMPACTED SUBSOIL. The USDA's Natural Resources Conservation Services Web Soils Survey is an easy to use on-line database of the soils for almost all of the US. According to the NRCS: "*Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.*"

Cost Impact: Will not increase the cost of construction.

GG131-14: 405.1.4.3(NEW)-THOMPSON932

GG132-14

405.2.2

Proponent: Denise Calabrese, Association of Professional Landscape Designers (APLD), representing APPLD (info@apld.org)

Revise as follows:

405.2.2 Invasive plant species. *Invasive plant species* shall not be planted on a building site. A management plan for the containment, removal and replacement of any *invasive plant species* currently on the site shall be generated based on either published recommendation for the referenced invasive plant or guidance ~~prepared~~ submitted by a qualified professional the owner or owner's authorized agent. Existing vegetation that is to be retained on a building site shall be protected as required by Section 405.2.

Reason: The term 'qualified professional' is undefined and could potentially be determined and decided on in such a way as to limit a person from the possibility of submitting the required information and thus regulate that person out of possible work.

We believe it would be better to request specific information to be included on an Invasive Species Management Plan (Section 405.2.2) than to qualify that by using the undefined term 'qualified professional'.

Other sections in the code, for example Section 401.2, states *what* information has to be submitted to comply with that section and we feel that a similar language, requesting information by anyone who can supply that information, is a more effective way to submit an Invasive Species Management Plan.

Cost Impact: Will not increase the cost of construction. While there likely would not be any cost implications to the code official or building department, it may be a less expensive option for the consumer, while providing a wider range of professionals the opportunity to create and submit this documentation.

GG132-14: 405.2.2-CALABRESE1176

GG133-14

SECTION 202 (New), 405.3

Proponent: Denise Calabrese, Association of Professional Landscape Designers (APLD) representing APLD (info@apld.org)

Revise as follows:

405.3 Native plant landscaping—Appropriate Plant Species Landscaping. ~~Where new landscaping is installed as part of a site plan or within the building site, not less than 75 percent of the newly landscaped area shall be planted with native plant species. Plants for new landscaping shall be non-invasive and shall be appropriate plant species. Not less than 25 percent of the site vegetated area shall be comprised of plant species that are native to the site or cultivars of such species. The site vegetated area shall be the estimated area that will be covered by the plantings, ten years after installation. Non-invasive plant species chosen for the landscaping shall not be indicated, at the time of the landscape design, as an invasive plant species for the site location according to regional lists, local noxious weeds laws and federal noxious weeds laws. Regional invasive plant species lists, for the purposes of this section, shall be those lists that are developed through a vetted and transparent process resulting in a list that is accepted by regional stakeholders.~~

Plants shall be nursery grown, legally harvested, or salvaged for reuse from either on or off the site. Nursery-grown plants shall comply with the requirements of the jurisdiction or, where jurisdiction requirements do not exist, ANSI Z60.1

Exception: Vegetative roofs and sites utilized for food production shall not be required to meet the requirement for use of plant species that are native to the site or cultivars of such species.

Add new definition as follows:

SECTION 202 **DEFINITIONS**

APPROPRIATE PLANT SPECIES. Native plants and non-native plants that are selected for use in a landscape design based on an evaluation by the landscape designer of the plant's cold hardiness, heat tolerance, salt tolerance, soil moisture range, plant water use requirements, soil volume requirements, soil pH requirements, sun and shade requirements, pest susceptibility, maintenance requirements, and ability to support the sustainability goals of the site including, but not limited to, energy conservation, water conservation, carbon sequestration, air and water filtration, erosion and sediment control, food production and biodiversity.

Add new standard(s) as follows:

ANSI
Z60.1-2004 American Standard for Nursery Stock

Reason: The original language of Sec. 405.3 specified installing 75% native plants. APLD strongly supports inclusion of native plants in a design scheme; native plants can provide habitat for native wildlife including important pollinator species such as birds and insects that are necessary for plant reproduction including cultivation of crops. However, mandating such a high percentage of native plants can exclude the choice of other vegetation that also provides substantial ecosystem services. Such services include carbon storage (in the biomass of plants), energy conservation (such as the cooling properties of strategically placed plants), air and water filtration (removing pollutants from air and water), and erosion and sediment control. Plant choices should be based on the design intent, with the aim of improving landscape performance and reducing resource use. In some cases that may dictate primarily native plants; in others, it may lead to different choices. For instance, if an urban commercial site wishes to employ food production as its landscape performance goal, this may mean using fewer native plants.

APLD supports the goals of the Sustainable Sites Initiative (SITES), a coalition of The Ladybird Johnson Wildflower Center at the University of Texas at Austin, the U.S. Botanic Garden, and the American Society of Landscape Architects. SITES convened informed professionals and employed authoritative resources to create guidelines for sustainable

sites. APLD has relied on SITES' *Guidelines and Performance Benchmarks 2009* to inform our code change proposal, believing those Guidelines to be the best expression of sustainable landscape planning. Our proposal is adapted from SITES' Guidelines Prerequisite 4.2, "Use Appropriate, Non-invasive Plants." Note that 4.2 is a prerequisite; it is similar to a code in that, like a code, it is a minimum standard that must be met. In the prerequisite, no percentage of native plants is specified. Instead, "appropriate" plants are defined and specified. Appropriate plants are those that are best qualified to thrive in the site conditions and to meet the design intent; it is the equivalent of "right plant, right place," a time-honored mantra of landscape professionals and seasoned gardeners alike. Appropriate plants, native or non-invasive non-native, should be available as choices for the design professional. We endorse the concept of using appropriate plants, but added the 25% native plant requirement so that jurisdictions have a quantifiable metric for evaluating compliance and in recognition of the importance of the role of native plants in the landscape. We believe the 25% requirement is feasible and will not hinder the inclusion of other, non-native appropriate plants.

ANSI Z60.1-2004 American Standard for Nursery Stock is available for viewing/download free of charge at the following weblink: http://americanhort.org/documents/nursery_stock_standards_AmericanHort_2004.pdf

Bibliography:

Sustainable Sites Initiative. 2009, *The Sustainable Sites Initiative: Guidelines and Performance Benchmarks 2009*. Available at <http://www.sustainablesites.org/report>.

Cost Impact: Will not increase the cost of construction. Jurisdictions monitoring conformance to 405.3 may need to hire or contract with trained, knowledgeable personnel to assist in the review. Finding and obtaining specified native plants may raise costs if resources in the project's location are scarce, but in the majority of cases the native plants are not likely to cost more than non-native plants.

GG133-14: 405.3-CALABRESE1006

GG134-14

405.3

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Delete without substitution:

~~**405.3 Native plant landscaping.** Where new landscaping is installed as part of a site plan or within the building site, not less than 75 percent of the newly landscaped area shall be planted with native plant species.~~

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

There is an overwhelming consensus in the scientific and professional communities that biodiversity is the best defense against uncertain futures. The IgCC needs to be about protecting the future of as many species as it can. A limitation on the use of adapted species is a direct limitation on biodiversity.

The rigid advancement of native species plantings focuses on origin rather than function. This approach does not fully accommodate our present or our future.

It is important to remember that a typical definition of native plantings relies upon what vegetation was present at the site, or in the area, when European colonists arrived in America. This definition is thus both geographically and temporally dependent.

America today is not the continent the European colonists found when disembarking from their wooden ships. Today's managed landscapes are not the natural landscapes of 1600 a. d. Hardscapes have changed our hydrology. Public works and power generation projects have changed our watersheds; agricultural and industrial and development activities have altered the structural and chemical composition of our soils. Our atmosphere is different. Our climate and our patterns of precipitation are changing. Our world is warmer now, and will be warmer still. Our coastal shorelines will move inland.

The plants we use today need to perform in ways that are true in this time and place, not some other.

Given the dynamism of our environment, and the particular challenges of the urban environment, it would be a mistake for the IGCC to erect barriers to appropriate plantings of vegetative materials simply because they are not deemed native, and to put forward non- appropriate plants for the installation simply because they are native.

Bibliography:

Don't Judge Species on Their Origins; Nature 474,153–154 (09 June 2011) Mark A. Davis, Matthew K. Chew, Richard J. Hobbs, Ariel E. Lugo, John J. Ewel, Geerat J. Vermeij, James H. Brown, Michael L. Rosenzweig, Mark R. Gardener, Scott P. Carroll, Ken Thompson, Steward T. A. Pickett, Juliet C. Stromberg, Peter Del Tredici, Katharine N. Suding, Joan G. Ehrenfeld, J. Philip Grime, Joseph Mascaro, John C. Briggs. [Don't Judge Species on Their Origins](#); [Author affiliations](#).

[Moving Beyond the Natives/Exotics Debate](#); Urban Habitats, Vol. 7, (March 2012) Nina Bassuk and Michelle Sutton

[The Restoration Gene Pool Concept: Beyond the Native Versus Non-Native Debate](#); Restoration Ecology Vol. 11 No. 3, pp. 281–290, T. A. Jones

[Mother Nature's Melting Pot](#); New York Times, April 2, 2011, Hugh Raffles

[Interwoven and Integrated: Non-native and Native Species in Life's Web](#); <http://sutroforest.com/> June 23, 2011

[Another Kind of Genocide](#) Review of Invasion Biology: Critique of a Pseudoscience, a book by David Theodoropoulos; <http://www.patternliteracy.com/> 2005 Toby Hemenway

Cost Impact: Will not increase the cost of construction

GG134-14 : 405.3-THOMPSON360

GG135-14

405.1.1, 405.1.2, 405.1.3, 405.1.4, 405.1.4.1, 405.1.4.2,
405.1.5, 405.2.1.1, 405.1.6, 405.2.2, 405.2.1, 406.2, 405.2,
405, 405.1, 405.3, 406.1

Proponent: Craig Conner, Self, representing self (craig.conner@mac.com)

Delete Section 405 in its entirety and substitute as follows:

~~SECTION 405~~

~~MANAGEMENT OF VEGETATION, SOILS AND EROSION CONTROL~~

SECTION 405

VEGETATION AND SOIL-PROTECTION

405.1 Vegetation and soil protection. Construction documents shall identify existing vegetation and soils located on a building site that are to be preserved and protected. Protected areas and plants with undisturbed soils shall be provided with a physical barrier, such as, but not limited to, temporary fencing or other physical barrier. Perimeters around trees shall be identified as a circle with a radius of not less than 1 foot (305 mm) for every inch (25.4 mm) of tree diameter, with a minimum radius of 5 feet (1524 mm). Perimeters around shrubs shall be not less than twice the radius of the shrub.

Exception: Approved alternative perimeters appropriate to the location and the species of the trees and shrubs.

405.2 Topsoil protection. Topsoil that potentially could be damaged by construction activities or equipment shall be removed from areas to be disturbed and stockpiled for future reuse on the building site or other approved location. Topsoil stockpiles shall be protected throughout the project with temporary or permanent soil stabilization measures to prevent erosion or compaction.

405.3 Soil reuse and restoration. Soils that are being placed or replaced on a building site shall be prepared, amended and placed in a manner that establishes or restores the ability of the soil to support the vegetation that has been protected and that will be planted.

Delete and substitute as follows:

406.1. Building site waste management plan. ~~A building site waste management plan shall be developed and implemented to divert not less than 75 percent of the land-clearing debris and excavated soils. Land-clearing debris includes rock, trees, stumps and associated vegetation. The plan shall include provisions that address all of the following:~~

- ~~1. Materials to be diverted from disposal by efficient usage, recycling or reuse on the building site shall be specified.~~
- ~~2. Diverted materials shall not be sent to sites that are agricultural land, flood hazard areas or greenfield sites where development is prohibited by Section 402.1 except where approved by the code official.~~
- ~~3. The effective destruction and disposal of invasive plant species.~~
- ~~4. Where contaminated soils are removed, the methods of removal and location where the soils are to be treated and disposed.~~
- ~~5. The amount of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.~~
- ~~6. Where the site is located in a federal or state designated quarantine zone for invasive insect species, building site vegetation management shall comply with the quarantine rules.~~
- ~~7. Receipts or other documentation related to diversion shall be maintained through the course of construction. When requested by the code official, evidence of diversion shall be provided~~

Land-clearing debris shall be reused or otherwise diverted from landfill or other disposal. Land-clearing debris includes rock, trees, stumps and associated vegetation. Storage of site waste shall be in compliance with the combustible waste material requirements of Section 304 of the International Fire Code.

Exception: Section 402.8 shall not be required where not in compliance with jurisdictional, state or Federal regulation; or deemed impractical by the code official.

Reason: This makes the site waste management more useable.
Cost Impact: Will not increase the cost of construction.

GG136-14

202 (New), 406.1, 406.2, 503.1

Proponent: Steven Ferguson, ASHRAE, representing ASHRAE (sferguson@ashrae.org)

Add new definition as follows:

SECTION 202 DEFINITIONS

ALTERNATIVE DAILY COVER. Cover material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter and scavenging.

Revise as follows:

406.1 Building site waste management plan. A building site waste management plan shall be developed and implemented to divert not less than 75 percent of the land-clearing debris and excavated soils from disposal at landfills. Land-clearing debris includes rock, trees, stumps and associated vegetation.

The plan shall include provisions that address all of the following:

1. Materials to be diverted from disposal by efficient usage, recycling or reuse on the building site shall be specified.
2. Diverted materials shall not be sent to sites that are agricultural land, *flood hazard areas* or *greenfield* sites where development is prohibited by Section 402.1 except where *approved by the code official*.
3. The effective destruction and disposal of *invasive plant species*.
4. Where contaminated soils are removed, the methods of removal and location where the soils are to be treated and disposed.
5. The amount of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
6. Where the site is located in a federal or state designated quarantine zone for invasive insect species, building site vegetation management shall comply with the quarantine rules.
7. Receipts or other documentation related to diversion shall be maintained through the course of construction. When requested by the *code official*, evidence of diversion shall be provided.

406.2 Construction waste. Construction materials and waste and hardscape materials removed during site preparation shall be managed in accordance with Section 503.

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal at landfills, except where other percentages are indicated in Table 302.1. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.

4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Materials that are processed for recycling and are used as *alternative daily cover* at landfills shall not be considered diverted materials. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: The proposed change clarifies that waste diversion is intended to divert materials from being deposited in landfills. These modifications are consistent with recent changes to ANSI/ASHRAE/USGC/IES Standard 189.1-2011 in section 9.3.1 (addendum aq).

Section 406.1: The first sentence does not specify where the materials are to be diverted from, therefore I have added in the indication that diversion should be from disposal at landfill.

Section 503.1: The first sentence was made more specific by the addition of "at landfills". Furthermore, it will be more consistent with language in table 302.1, and with proposed changes to section 406.1.

New Definition for Section 202: this definition defines *alternative daily cover*, and is the same definition used in 189.1 9.3.1 addendum aq.

Cost Impact: Will not increase the cost of construction.

GG136-14: 406.1-FERGUSON864

GG137-14

406.1

Proponent: Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov)

Revise as follows:

406.1 Building site waste management plan. A building site waste management plan shall be ~~developed~~ submitted with the construction documents and implemented to divert not less than 90 ~~75~~ percent of the land-clearing debris and excavated clean soils. Land-clearing debris includes rock, trees, stumps and associated vegetation, and does not include *invasive plant species*. The plan shall include provisions that address all of the following:

1. Materials to be diverted from disposal by efficient usage, recycling or reuse on the building site shall be specified.
2. Diverted materials shall not be sent to sites that are agricultural land, *flood hazard areas* or *greenfield* sites where development is prohibited by Section 402.1 except where *approved* by the *code official*.
3. The effective destruction and disposal of *invasive plant species*.
4. Where contaminated soils are removed, the methods of removal and location where the soils are to be treated and disposed.
5. The amount of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
6. Where the site is located in a federal or state designated quarantine zone for invasive insect species, building site vegetation management shall comply with the quarantine rules.
7. Receipts or other documentation related to ~~diversion~~ the reuse, recycling and disposal of land-clearing debris and excavated clean soils shall be maintained through the course of construction. When requested by the *code official*, evidence of diversion shall be provided. *Invasive plant species and contaminated soils shall be composted only in facilities that are licensed to handle the specific feedstock.*

Reason: As currently written, it is not clear if 406.1 requires submittal of the building site waste management plan so this proposal helps to clarify.

Composting should be encouraged, and there are legitimate and appropriate composting systems and technologies which can effectively handle landclearing-debris comprised of either invasive plant species or contaminated soil. This proposal helps to encourage provide suitable direction for composting the more challenging feedstock.

This proposal also increases the minimum diversion percentage of clean material from 75% to 90%, because it has been proven in areas such as the City of Portland and City of Seattle that 100% of material can be successfully banned from landfills and incineration.

Cost Impact: Will not increase the cost of construction.

GG137-14: 406.1-PETRIE1189

GG138-14

406.2, 406.1, 503.1

Proponent: Brenda Thompson, Clark County Development Services, representing Sustainability, Energy & High Performance Building Code Action Committee

Delete without substitution:

~~**406.2 Construction waste.** Construction materials and waste and hardscape materials removed during site preparation shall be managed in accordance with Section 503.~~

Revise as follows:

~~**406.503.1 Building site Waste management plan for land clearing debris and excavated soils.** Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. A Construction Material and A building site waste management plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with divert not less than 75 percent of the land-clearing debris and excavated soils.. Land-clearing debris includes rocks, trees and stumps and associated vegetation. The plan shall include provisions that address all of the following:~~

- ~~1. The location for collection, separation and storage of recyclable construction waste shall be indicated.~~
- ~~2.1. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale or reuse on the building site shall be specified.~~
- ~~2. Diverted materials shall not be sent to sites that are agricultural land, flood hazard areas or greenfield sites where development is prohibited by Section 402.1 except where approved by the code official.~~
- ~~3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both. The effective destruction and disposal of invasive plant species.~~
- ~~4. Where contaminated soils are removed, the methods of removal and location where the soils are to be treated and disposed.~~
- ~~5. The amount of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.~~
- ~~6. Where the site is located in a federal or state designated quarantine zone for invasive insect species.~~
- ~~4.7. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where/When requested by the code official, evidence of diversion shall be provided.~~

~~For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as,~~

~~but not limited to, topsoil, sand and gravel. Land clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land clearing debris shall be managed in accordance with Section 406.1.~~

503.42 Construction Building and paving construction material and waste management plan.

Not less than 50 percent of nonhazardous building and paving construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, building and paving construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Building and paving construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. ~~Land clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land clearing debris shall be managed in accordance with Section 406.1.~~

Reason: Building site waste management overlaps in concept and implementation with that of construction waste management, and it therefore makes sense to combine them into a single section. Moreover, as the Sections 406 and 503 now cross-reference each other, this creates an opportunity to remove the (extraneous) cross-referencing language.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG138-14: 406.2-THOMPSON307

GG139-14

202 (New), 406.3 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

406.3 Concrete washout water. Concrete washout water shall be prohibited from entering sewers, catch basins, storm drains, natural and man-made bodies of water, and shall be prohibited from leaching into the ground. Concrete washout water shall be collected and contained in a reservoir on the concrete mixing truck or in a manufactured watertight container that is specifically designed and fabricated for the purpose of collecting and containing concrete washout water created during onsite operations. Collected concrete washout water shall be either transported offsite for treatment and disposal or allowed to remain onsite until the water component is completely evaporated or consumed by chemical reaction. The remaining dry material shall be reused, recycled or deposited in a landfill.

Add new definition as follows:

SECTION 202 DEFINITIONS

CONCRETE WASHOUT WATER. Wastewater from the rinsing of equipment used to mix, transport, convey or place concrete. Such equipment shall include, but be not limited to, concrete buckets, concrete hose lines and pumps, boots, shovels, finishing tools, wheelbarrows, motorized concrete carts, concrete pour funnels and chutes of concrete mixing trucks and machines.

Reason: The runoff from water that is used to rinse concrete trucks and related equipment is highly corrosive and should not be discharged onto public streets, as is commonly done. Residue from concrete components gives concrete washout water a pH comparable to Drano® Clog Remover, and contains many toxic metals and metalloids. These pollutants can damage municipal sewer systems, and the rivers into which these systems commonly outflow. Capturing concrete washout water will reduce its environmental effects. A regulation to this effect was established in New York City in 2011.

Bibliography:

NYC Green Codes Task Force, Proposal HT13: Treat Corrosive Concrete Wastewater ([Proposal](#))

NYC Local Law 70 of 2011 ([Law](#); [Legislative Summary](#))

NYC Building Code Section 3302.1 and 3303.15 ([Code Reference](#))

Cost Impact: Will not increase the cost of construction.

GG139-14: 406.3 (NEW)-SCHEIB1119

GG 140-14

407, 407.1, 407.2, 407.2.1 (New), 407.2.2 (New), 407.2.3 (New), 407.3, 407.3.1, 407.3.2

Proponent: Hope Medina, representing Cherry Hills Village (hmedina@coloradocode.net); Craig Conner, representing self (craig.conner@mac.com)

Revise as follows:

SECTION 407 TRANSPORTATION IMPACT BICYCLES

407.1 Walkways and bicycle paths. ~~Not less than one independent, paved walkway or bicycle path suitable for bicycles, strollers, pedestrians, and other forms of nonmotorized locomotion connecting a street or other path to a building entrance shall be provided. Walkways and bicycle paths shall connect to existing paths or sidewalks, and shall be designed to connect to any planned future paths. Paved walkways and bicycle paths shall be designed to minimize stormwater runoff. Pervious and permeable pavement shall be designed in accordance with Section 408.2.4. Walkways and bicycle paths shall connect to existing paths or sidewalks, and shall be designed to connect to planned future paths. Walkways and bicycle paths shall be designed to support stormwater management. Walkways and bicycle paths shall not interfere with fire and emergency apparatus, vehicle and personnel access.~~

407.2 Changing and shower facilities Bicycle parking. ~~Buildings with a total building floor area greater than 10,000 square feet (929 m²) and that are required to be provided with long term bicycle parking and storage in accordance with Section 407.3 shall be provided with onsite changing room and shower facilities. Not less than one shower shall be provided for each 20 long term bicycle parking spaces, or fraction thereof. Where more than one changing room and shower facility is required, separate facilities shall be provided for each sex. Bicycle parking shall comply with Sections 407.2.1 through 407.2.3.~~

Add new text as follows:

407.2.1 Number of spaces. The number of bicycle parking spaces shall be not less than one for each one hundred occupants and not less than four bicycle parking spaces shall be provided The occupant load shall be determined in accordance with Section 1004 of the *International Building Code Accessory* occupancy areas shall be included in the calculation of primary occupancy area

Exceptions:

1. Bicycle parking shall not be required where the conditioned space is less than 2 000 square feet (1232 m²)
- 2 Subject to the approval of the *code official* the number of bicycle parking spaces shall be permitted to be reduced due to *building site* characteristics including but not limited to isolation from other development
- 3 Bicycle parking shall not be required for Group R occupancies

Bicycle parking spaces for multiple buildings shall be permitted to be combined provided that the spaces are sufficient for the combined occupant load of the buildings

407.2.2 Description of spaces. Bicycle parking spaces shall comply with the following:

1. Shall have an area of not less than 18 inches 1457 mml by 60 inches 11524 mml for each bicycle.
2. Shall be provided with a rack or other facility for locking or securing each bicycle.

407.2.3 Location of spaces. The location of bicycle parking shall be designated on the site plan. Vehicle parking spaces other than those required for local zoning requirements and the accessible parking required by the *International Building Code* shall be permitted to be used for the installation of bicycle parking spaces. Bicycle parking shall comply with the following:

1. Bicycle parking spaces shall be located within 100 feet of the main entrance of the building and shall be visible from the main entrance.
2. Bicycle parking shall be located at the same grade as the sidewalk or at a location reachable by a ramp or accessible route.

Exception: Where directional signage is provided at the main *building* entrances, *bicycle parking* shall be permitted to be located inside a *building* or at locations not visible from the main entrance, provided that such locations are accessible.

Delete without substitution:

~~**407.3 Bicycle parking and storage.** Long-term and short-term bicycle parking shall be designated on the site plan by a *registered design professional* and as specified in Table 407.3. The required number of spaces shall be determined based on the net floor area of each primary use or occupancy of a building except where Table 407.3 specifies otherwise. Accessory occupancy areas shall be included in the calculation of primary occupancy area.~~

~~**Exceptions:**~~

- ~~1. Long-term bicycle parking shall not be required where the *total building floor area* is less than 2,500 square feet (232 m²).~~
- ~~2. Subject to the approval of the *code official*, the number of bicycle parking spaces shall be permitted to be reduced because of building site characteristics including, but not limited to, isolation from other development.~~

~~**TABLE 407.3
BICYCLE PARKING**~~

~~**407.3.1 Short-term bicycle parking.** Short-term bicycle parking shall comply with all of the following:~~

- ~~1. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;~~
- ~~2. It shall be located at the same grade as the sidewalk or at a location reachable by ramp or accessible route;~~
- ~~3. It shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle;~~
- ~~4. It shall be provided with a rack or other facility for locking or securing each bicycle; and~~
- ~~5. It shall be located within 100 feet (30 480 mm) of, and visible from, the main entrance.~~

~~**Exception:** Where directional signage is provided at the main building entrances, short-term bicycle parking shall be permitted to be provided at locations not visible from the main entrance.~~

~~**407.3.2 Long-term bicycle parking.** Long-term bicycle parking shall comply with all of the following:~~

- ~~1. It shall be located on the same site and within the building or within 300 feet (91 440 mm) of the main entrances;~~
- ~~2. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;~~

3. ~~It shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle; and~~
4. ~~It shall be provided with a rack or other facility for locking or securing each bicycle.~~

~~Not less than 50 percent of long-term bicycle parking shall be within a building or provided with a permanent cover including, but not limited to, roof overhangs, awnings, or bicycle storage lockers.~~

~~Vehicle parking spaces, other than those required by Section 407.4, local zoning requirements and accessible parking required by the *International Building Code*, shall be permitted to be used for the installation of long-term bicycle parking spaces.~~

Reason: The existing text for bicycle regulations is too complex. There is no need to distinguish between long term and short term parking. The equipment that will need to be provided are the same whether it's a bicycle parked for 3 hours or for 5, so why make this section more complicated and costly than what it needs to be. It's important to have reasonable requirements for bicycle parking, and should be encouraged to be used.

Showers and changing facilities are a requirement that is excessive. There is an additional cost associated with providing shower facilities for both sexes. Many of the jurisdictions around the country are in or have been in drought conditions where financial penalties are assessed for consuming more water than what is set per the water provider's tier systems. We have a chapter in this code titled Water Resource Conservation, Quality and Efficiency, but we have a needless requirement for shower facilities for what is considered long-term bicycle parking.

Cost Impact: Will not increase the cost of construction.

GG 140-14: 407-MEDINA1193

GG141-14

407.3

Proponent: Ed Fendley, USEPA, representing USEPA

Revise as follows:

407.3 Bicycle parking and storage. Long-term and short-term bicycle parking shall be designated on the site plan by a *registered design professional* and as specified in Table 407.3. The required number of spaces shall be determined based on the net floor area of each primary use or occupancy of a building except where Table 407.3 specifies otherwise. Accessory occupancy areas shall be included in the calculation of primary occupancy area.

Exceptions:

1. Long-term bicycle parking shall not be required where the *total building floor area* is less than 2,500 square feet (232 m²).
2. Subject to the approval of the *code official*, the number of bicycle parking spaces shall be permitted to be reduced because of ~~building site characteristics including, but not limited to, isolation from other development~~ the building site is inaccessible to bicyclists such as, but not limited to, where the building site is accessible only via controlled-access highways.

Reason: The proposed language is offered as a substitute for the language currently in the second exception, which is overly broad and vague. In particular, the phrase "isolation from other development" does not present a good example of a reason for reducing bicycle spaces. "Isolation" feasibly could be interpreted as referring to a site just outside of an existing community, which may not be a long ride for bicyclists. Moreover, even if the site is miles away from other development, it could still be reached by bicyclists, as long as a road or path is available. Unless "isolation" is better defined, a lack of road (or path) that could legally be used by bicyclists to reach the building is a better indicator of whether people will bicycle to the building.

The change in wording, however, would not preclude a builder or code official from considering the distance from other development.

Cost Impact: Will not increase the cost of construction

GG141-14: 407.3-GITLIN184

GG142-14

407.3

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

Revise as follows:

407.3 Bicycle parking and storage. Long-term and short-term bicycle parking shall be designated ~~on the site plan by a registered design professional and provided~~ as specified in Table 407.3. The required number of spaces shall be determined based on the net floor area of each primary use or occupancy of a building except where Table 407.3 specifies otherwise. Accessory occupancy areas shall be included in the calculation of primary occupancy area.

Exceptions:

1. Long-term bicycle parking shall not be required where the *total building floor area* is less than 2,500 square feet (232 m²).
2. Subject to the approval of the *code official*, the number of bicycle parking spaces shall be permitted to be reduced because of building site characteristics including, but not limited to, isolation from other development.

Reason: The intent of this proposal is to specify bicycle parking spaces are to be provided on the site. As currently written, this section only requires them to be shown on the site plan. The proposed text is also more consistent with the rest of Section 407, which describes what needs to be provided, but does not describe where the information is shown on the plans, nor who is required to provide the information.

Cost Impact: Will not increase the cost of construction. This is an editorial change that does not affect the requirements for bicycle parking.

GG142-14: 407.3-SIU1188

GG143-14

407.3

Proponent: Susan Gitlin, US Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov)

Revise as follows:

407.3 Bicycle parking and storage. Long-term and short-term bicycle parking shall be designated on the site plan by a *registered design professional* and as specified in Table 407.3. The required number of spaces shall be determined based on the net floor area of each primary use or occupancy of a building except where Table 407.3 specifies otherwise. Accessory occupancy areas shall be included in the calculation of primary occupancy area.

Exceptions:

1. Long-term bicycle parking shall not be required where the *total building floor area* is less than 2,500 square feet (232 m²).
2. Subject to the approval of the *code official*, the number of bicycle parking spaces shall be permitted to be reduced because of building site characteristics including, but not limited to, isolation from other development.

**TABLE 407.3
BICYCLE PARKING^a**

OCCUPANCY	SPECIFIC USE	SHORT-TERM SPACES	LONG-TERM SPACES ^b
A-1	Movie theaters	1 per 50 seats; not less than 4	2 spaces
	Concert halls, theaters other than for movies	1 per 500 seats	
A-2	Restaurants	1 per 50 seats; not less than 2	
A-3	Places of worship	1 per 500 seats	
A-3	Assembly spaces other than places of worship	1 per 25,000 square feet; not less than	1 per 50,000 square feet; not less than 2 spaces
A-4 – A-5	All	1 per 500 seats	2 spaces
B	All	1 per 50,000 square feet; not less than	1 per 25,000 square feet; not less than 2 spaces
E	Schools	None Not less than 2 spaces	1 per 250 square feet of classroom area
E, I-4	Day care	None Not less than 2 spaces	2 spaces
F, H	All	None Not less than 2 spaces	1 per 25,000 square feet; not less than 2 spaces
I-1	All	None Not less than 2 spaces	2 spaces
I-2	All	1 per 25,000 square feet; not less than 2	1 per 50,000 square feet; not less than 2 spaces

M	All	1 per 25,000 square feet; not less than 2 spaces	1 per 50,000 square feet; not less than 2 spaces
R-1	Hotels, motels, boarding houses	None Not less than 2 <u>spaces</u>	1 per 25,000 square feet; not less than 2 spaces
R-2, R-3, R-4	All	None Not less than 2	None
S	Transit park and ride lots	None	1 per 20 vehicle parking spaces
	Commercial parking facilities	1 per 20 vehicle parking spaces	None
	All other	None	2 spaces
Other	Outdoor recreation, parks	1 per 20 vehicle parking spaces; not less than 2 spaces	None

For SI: 1 square foot = 0.0929 m².

- a. Requirements based on square feet shall be the net floor area of the occupancy or use.
- b. When a calculation results in a fraction of space, the requirements shall be rounded to the next higher whole number.

Reason: The use of bicycles as a means of transportation is thwarted when bicycle parking facilities are not available to riders. Whenever a building may be a destination for visitors or delivery personnel, it is important to provide short-term bicycle parking spots. This proposal revises Table 407.3 to require a minimum number of short-term bicycle parking spaces to types of buildings that could receive visitors and deliveries, but where no short-term bicycle parking is currently required.

Bibliography:

Association of Pedestrian and Bicycle Professionals' *Bicycle Parking Guidelines*, 2nd Edition, 2010, www.apbp.org.

Cost Impact: Will increase the cost of construction. The code change proposal will slightly increase the cost of construction for a few types of buildings.

GG143-14: TABLE 407.3-GITLIN135

GG144-14

407.3, 407.3.1, 407.3.2

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

407.3 Bicycle parking and storage. Long-term and short-term bicycle parking shall be designated on the site plan by a *registered design professional* and as specified in Table 407.3. The required number of spaces shall be determined based on the net floor area of each primary use or occupancy of a building except where Table 407.3 specifies otherwise. Accessory occupancy areas shall be included in the calculation of primary occupancy area.

Exceptions:

1. Long-term bicycle parking shall not be required where the *total building floor area* is less than 2,500 square feet (232 m²).
2. Subject to the approval of the *code official*, the number of bicycle parking spaces shall be permitted to be reduced because of building site characteristics including, but not limited to, isolation from other development.

**TABLE 407.3
BICYCLE PARKING^a**

OCCUPANCY	SPECIFIC USE	SHORT-TERM SPACES	LONG-TERM SPACES ^b
A-1	Movie theaters	1 per 50 seats; not less than 4 spaces	2 spaces
	Concert halls, theaters other than for movies	1 per 500 50 seats; <u>not less than 4 spaces</u>	
A-2	Restaurants	1 per 50 seats <u>or 1 space per 5000 square feet, whichever is greater</u> ; not less than 2 spaces	
A-3	Places of worship	1 per 500 seats; <u>not less than 4</u>	
A-3	Assembly spaces other than places of worship	<u>1 per 50 seats or 1 per 25,000 square feet, whichever is greater</u> ; not less than <u>24</u> spaces	
A-4 – A-5	All	1 per 500 seats; <u>not less than 4</u>	2 spaces
B	All	1 per 50,000 <u>20,000</u> square feet; not less than 2 spaces	1 per 25,000 <u>10,000</u> square feet; not less than 2 spaces
E	Schools	None	1 per 250 square feet of classroom area; <u>not less than 2</u>
E, I-4	Day care	None	2 spaces
F, H	All	None	1 per 25,000 square feet; not less than 2 spaces
I-1	All	None	2 spaces

I-2	All	1 per 25,000 square feet; not less than 2 spaces	1 per 50,000 square feet; not less than 2 spaces
M	All	1 per 25,000 20,000 square feet; not less than 2 spaces	1 per <u>20 employees or</u> 50,000 square feet; not less than 2 spaces
R-1	Hotels, motels, boarding houses	None	1 per 25,000 square feet; not less than 2 spaces
R-2, R-3, R-4	All	None	None
S	Transit park and ride lots	None	1 per 20 <u>motor</u> vehicle parking spaces
	Commercial <u>motor vehicle</u> parking facilities	1 per 20 <u>motor</u> vehicle parking spaces; not less than 6 spaces	None 1 per 20 <u>motorized</u> vehicle parking spaces; not less than 2 spaces. <u>Exception: Unattended surface parking lots.</u>
	All other	None	2 spaces
Other	Outdoor recreation, parks	1 per 20 vehicle parking spaces; not less than 2 spaces	None

For SI: 1 square foot = 0.0929 m².

- a. Requirements based on square feet shall be the net floor area of the occupancy or use.
- b. When a calculation results in a fraction of space, the requirements shall be rounded to the next higher whole number.

407.3.1 Short-term bicycle parking. Short-term bicycle parking shall comply with all of the following:

1. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
2. It shall be located at the same grade as the sidewalk or at a location reachable by ramp or accessible route;
3. It shall have an area of not less than 18 inches (457 mm) by ~~60~~ 72 inches (~~1524~~ 1829 mm) for each bicycle;
4. It shall be provided with a rack or other facility for locking or securing each bicycle; ~~and~~ Bicycle racks, where used, shall: support bicycles in not less than two places; allow for locking the bicycle frame and not less than one wheel with a U-style lock; be securely anchored to the ground; resist cutting, rusting, and deformation; and be installed in accordance with the rack manufacturer's specifications.
5. It shall be located within 100 feet (30 480 mm) of, and visible from, the main entrance.

Exception: Where directional signage is provided at the main building entrances, short-term bicycle parking shall be permitted to be located inside the building or provided at locations not visible from the main entrance.

407.3.2 Long-term bicycle parking. Long-term bicycle parking shall comply with all of the following:

1. It shall be located on the same site and within the building or within 300 feet (91 440 mm) of the main entrances;
2. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
3. It shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle; and
4. It shall be provided with a rack or other facility for locking or securing each bicycle. Bicycle racks, where used, shall: support bicycles in not less than two places; allow for locking the bicycle frame and not less than one wheel with a U-style lock; be securely anchored to the ground; resist cutting, rusting, and deformation; and be installed in accordance with the rack manufacturer's specifications.

Not less than 50 percent of long-term bicycle parking shall be within a building or provided with a permanent cover including, but not limited to, roof overhangs, awnings, or bicycle storage lockers.

Vehicle parking spaces, other than those required by Section 407.4, local zoning requirements and accessible parking required by the *International Building Code*, shall be permitted to be used for the installation of long term bicycle parking spaces.

Reason: We recommend that the bicycle parking requirements—including the provisions related to the minimum number of required spaces, the location of the parking spaces, the rack requirements, and the area provided per bicycle -- be updated to achieve greater consistency with the Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines Second Edition, 2010.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will increase the cost of construction.

GG144-14: TABLE 407.3-THOMPSON305

GG145-14

407.3.1

Proponent: Ed Fendley, US Environmental Protection Agency, representing USEPA

Revise as follows:

407.3.1 Short-term bicycle parking. Short-term bicycle parking shall comply with all of the following:

1. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
2. It shall be located at the same grade as the sidewalk or at a location reachable by ramp or accessible route;
3. It shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle;
4. It shall be provided with a rack or other facility for locking or securing each bicycle; and
5. It shall be located within 50 feet (15,240 mm) ~~100 feet (30,480 mm)~~ of, and visible from, the main entrance, or within 100 feet (30,480 mm) of the main entrance with directional signage provided at the main building entrance.

Exception: ~~Where directional signage is provided at the main building entrances, short term bicycle parking shall be permitted to be provided at locations not visible from the main entrance.~~

Reason: When bicycle parking is located farther than 50 feet from an entrance, bicyclists tend to lock their bicycles to any fixture they can find – a tree, a bench, a parking meter, etc. This can cause damage to or reduce the utility of the fixture, and can create obstacles and hazards in walkways.

Accordingly, this proposal reduces the minimum distance between the front entrance and the short-term bicycle racks, but allows an exception for instances where signage is provided.

The current exception applies only to the fifth requirement, and only one part of the fifth requirement, at that. The exception would be clearer if it were combined with the fifth requirement as an alternative to the entirety of that requirement. In this proposal, we merged the exception with the fifth requirement and amended it slightly to allow for an exception to the 50-foot requirement. (Currently, the exception allows an option for placing the bicycle racks in a spot that is not visible at the main entrance. This proposal would expand that exception to pertain also to spots that are greater than 50' from the main entrance.)

Bibliography:

Association of Pedestrian and Bicycle Professionals' *Bicycle Parking Guidelines*, 2nd Edition, 2010, www.apbp.org.

Cost Impact: Will not increase the cost of construction

GG145-14: 407.3.1 #1-GITLIN187

GG146-14

407.3.1, 407.3.2

Proponent: Ed Fendley, U.S. Environmental Protection Agency, representing USEPA

Revise as follows:

407.3.1 Short-term bicycle parking. Short-term bicycle parking shall comply with all of the following:

1. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
2. It shall be located at the same grade as the sidewalk or at a location reachable by ramp or accessible route;
3. It shall have an area of not less than 18 inches (457mm) by 6072 inches (1524-1829mm) for each bicycle;
4. It shall be provided with a rack or other facility for locking or securing each bicycle; and
5. It shall be located within 100 feet (30 480 mm) of, and visible from, the main entrance.

Exception: Where directional signage is provided at the main building entrances, short-term bicycle parking shall be permitted to be provided at locations not visible from the main entrance.

407.3.2 Long-term bicycle parking. Long-term bicycle parking shall comply with all of the following:

1. It shall be located on the same site and within the building or within 300 feet (91 440 mm) of the main entrances;
2. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
3. It shall have an area of not less than 18 inches (457mm) by ~~6072~~ inches (1524-1829mm) for each bicycle; and
4. It shall be provided with a rack or other facility for locking or securing each bicycle.

Not less than 50 percent of long-term bicycle parking shall be within a building or provided with a permanent cover including, but not limited to, roof overhangs, awnings, or bicycle storage lockers.

Vehicle parking spaces, other than those required by Section 407.4, local zoning requirements and accessible parking required by the *International Building Code*, shall be permitted to be used for the installation of long term bicycle parking spaces.

Reason: The length of a typical bicycle ranges between 5' and 6'.5' (60 inches) is too short to accommodate many bicycles. This proposal increases the length requirement to better accommodate the typical bicycle.

Bibliography:

Association of Pedestrian and Bicycle Professionals' *Bicycle Parking Guidelines*, 2nd Edition, 2010, www.apbp.org

Minnesota Department of Transportation, *Mn/DOT Bikeway Facility Design Manual*, March 2007, <http://www.dot.state.mn.us/bike/pdfs/manual/Chapter3.pdf>

Cost Impact: Will increase the cost of construction. This proposal may slightly increase the cost of construction.

GG146-14: 407.3.1 #2-GITLIN401

GG147-14

407.3.1, 407.3.2

Proponent: Ed Fendley, U.S. Environmental Protection Agency, representing USEPA

Revise as follows:

407.3.1 Short-term bicycle parking. Short-term bicycle parking shall comply with all of the following:

1. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
2. It shall be located at the same grade as the sidewalk or at a location reachable by ramp or accessible route;
3. It shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle;
4. It shall be provided with a rack or other facility for locking or securing each bicycle; and
5. It shall be located within 100 feet (30 480 mm) of, and visible from, the main entrance.

Exception: Where directional signage is provided at the main building entrances, short-term bicycle parking shall be permitted to be provided at locations not visible from the main entrance.

6. Each rack shall provide not less than two points of contact between the bicycle frame and the rack and allow that the frame and not less than one wheel of the bicycle be locked to the rack with a U-shaped shackle lock.

407.3.2 Long-term bicycle parking.

Long-term bicycle parking shall comply with all of the following:

1. It shall be located on the same site and within the building or within 300 feet (91 440 mm) of the main entrances;
2. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
3. It shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle; and
4. It shall be provided with a rack or other facility for locking or securing each bicycle.
5. Each rack shall provide not less than two points of contact between the bicycle frame and the rack and allow that the frame and not less than one wheel of the bicycle be locked to the rack with a U- shaped shackle lock.

Not less than 50 percent of long-term bicycle parking shall be within a building or provided with a permanent cover including, but not limited to, roof overhangs, awnings, or bicycle storage lockers.

Vehicle parking spaces, other than those required by Section 407.4, local zoning requirements and accessible parking required by the *International Building Code*, shall be permitted to be used for the installation of long term bicycle parking spaces.

Reason: This proposal addresses two criteria essential to effective bicycle racks: bicycle security and bicycle stability.

For bicycles to be used as a means of transportation, bicyclists need to be confident that they have a place to store or park their bikes that is reasonably safe from theft. The recent rise in bicycle theft makes the need for such security of particular importance. Cable locks and chains are easily cut; u-shaped shackle locks provide a much more reliable means of securing a bicycle. Thus, racks should accommodate u-shaped locks and allow for the use of such locks to secure frame of the bicycle and at least one wheel to the rack.

Bicycle stability is important as it makes the rack more usable for the bike rider and reduces the chances that a bicyclist will use more space than necessary. More specifically, a bike rack should provide two points of contact between the rack and the frame of the bicycle. This provides support for the bicycle as the rider locks and unlocks the bicycle and helps keep a bicycle in place if another rider touches the bicycle when locking up or removing another bicycle. Absent this support, many riders place their bicycles parallel to the set of racks, thus using many spaces that had been intended for other riders and effectively reducing the number of available bicycle spaces.

Bibliography:

Association of Pedestrian and Bicycle Professionals' *Bicycle Parking Guidelines*, 2nd Edition, 2010, www.apbp.org.

Cost Impact: Will increase the cost of construction. The code change proposal may increase the cost of construction.

GG147-14: 407.3.1#3-GITLIN189

GG148-14

407.3.1, 407.3.2

Proponent: Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov)

Revise as follows:

407.3.1 Short-term bicycle parking. Short-term bicycle parking shall comply with all of the following:

1. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
2. It shall be located at the same grade as the sidewalk or at a location reachable by ramp or accessible route;
3. Horizontal parking spaces shall have a floor area of not less than 18 inches (457 mm) by 60 inches (1524mm) for each bicycle.
4. Vertical parking spaces shall have a floor area of not less than 18 inches (457 mm) by 44 inches (1118 mm) for each bicycle with not less than 24 inches (610 mm) of clearance above the highest point of the bicycle rack;
- ~~5-4~~ It shall be provided with a rack or other facility for locking or securing each bicycle; and
- ~~6-5~~ It shall be located within 100 feet (30 480 mm) of, and visible from the main entrance.

Exception: Where directional signage is provided at the main building entrances, short term bicycle parking shall be permitted to be provided at locations not visible from the main entrance.

407.3.2 Long-term bicycle parking. Long-term bicycle parking shall comply with all of the following:

1. It shall be located on the same site and within the building or within 300 feet (91 440 mm) of the main entrances;
2. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
3. Horizontal parking spaces shall have a floor area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle
4. Vertical parking spaces shall have a floor area of not less than 18 inches (457 mm) by 44 inches (1118 mm) for each bicycle, with not less than 24 inches (610 mm) of clearance above the highest point of the bicycle rack; and
- ~~5-4~~ It shall be provided with a rack or other facility for locking or securing each bicycle.

Not less than 50 percent of long-term bicycle parking shall be within a building or provided with a permanent cover including, but not limited to, roof overhangs, awnings, or bicycle storage lockers.

Vehicle parking spaces, other than those required by Section 407.4, local zoning requirements and accessible parking required by the *International Building Code*, shall be permitted to be used for the installation of long term bicycle parking spaces.

Reason: Although Section 407.3 identifies the design area for horizontal bicycle parking spaces, it does not provide guidance for vertical bicycle parking, which this proposal now addresses. Bicycle parking areas are often shown on plans without dimensions demonstrating that the square footage provided meets the number of bicycle parking spaces required.

This may result in a parking area that is too small to accommodate the intended demand. By adding dimensions for vertical bicycle parking clearance, this section increases design and space flexibility.

Cost Impact: Will not increase the cost of construction.

GG148-14: 407.3.1-PETRIE972

GG149-14

407.3.2

Proponent: Susan Gitlin, U.S. Environmental Protection Agency, representing USEPA (gitlin.susan@epa.gov)

Revise as follows:

407.3.2 Long-term bicycle parking. Long-term bicycle parking shall comply with all of the following:

1. It shall be located on the same site and within the building or within 300 feet (91 440 mm) of the main entrances;
2. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
3. It shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle; and
4. It shall be provided with a rack or other facility for locking or securing each bicycle.

Not less than 50 percent of long-term bicycle parking spaces shall comply with both of the following:

- ~~1. be within a building or provided with a~~ They shall provide permanent cover including, but not limited to, roof overhangs, awnings, ceilings of rooms or bicycle storage lockers.
2. They shall be within a building, cage or bicycle storage lockers.

Vehicle parking spaces, other than those required by Section 407.4, local zoning requirements and accessible parking required by the *International Building Code*, shall be permitted to be used for the installation of long term bicycle parking spaces.

Reason: Long-term parking requires a greater degree of security than that demanded of short-term bicycle parking, because the rider is away from the bicycle for greater lengths of time (a fact that gives a would-be thief more time to carry out a theft and more confidence in doing so), and because the bicycle storage may be located farther away from the main entrance and less visible to the protective eyes of the building occupants. The language in this proposal clarifies that bicycles in long-term parking must have the protection of being inside a building, within a cage, or within a locker.

Bibliography:

Association of Pedestrian and Bicycle Professionals' *Bicycle Parking Guidelines*, 2nd Edition, 2010, www.apbp.org

Cost Impact: Will increase the cost of construction. The code change proposal may increase the cost of construction.

GG149-14: 407.3.2-GITLIN180

GG150-14

407.3.2

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org); Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

407.3.2 Long-term bicycle parking. Long-term bicycle parking shall comply with all of the following:

1. It shall be located on the same building site and or within the building ~~or within 300 feet (91 440 mm) of the main entrances;~~
2. It shall be provided with illumination of not less than 1 footcandle (11 lux) at the parking surface;
3. It shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle; and
4. It shall be provided with a rack or other facility for locking or securing each bicycle.

Not less than 50 percent of long-term bicycle parking shall be within a building or provided with a permanent cover including, but not limited to, roof overhangs, awnings, or bicycle storage lockers, or within covered parking structures.

Vehicle parking spaces, other than those required by Section 407.4, local zoning requirements and accessible parking required by the *International Building Code*, shall be permitted to be used for the installation of long term bicycle parking spaces.

Reason: Hospitals often have multiple building sites. This proposal makes two changes.

Change to Item 1 – The 300 foot travel distance does not work on multi-building site. Putting it close is already covered by the definition of 'building site', so the travel distance limitation is not needed.

Change to Item 4 - Using a parking garage to provides covered spaces for bikes should be allowed as an option. This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG150-14: 407.3.2-PAARLBERG425

GG151-14

407.4, 407.4.1, 407.4.2

Proponent: Gregory Johnson, representing self (gjohnsonconsulting@gmail.com)

Revise as follows:

407.4 Preferred Vehicle parking. Where either Section 407.4.1 or 407.4.2 is indicated to be applicable in Table 302.1, parking provided at a building site shall comply with this section. ~~Preferred parking spaces required by this section shall be those in the parking facility that are located on the shortest route of travel from the parking facility to a building entrance, but shall not take precedence over parking spaces that are required to be accessible in accordance with the *International Building Code*. Where buildings have multiple entrances with adjacent parking, parking spaces required by this section shall be dispersed and located near the entrances. Such Required parking spaces shall be provided with *approved* signage that specifies the permitted usage.~~

407.4.1 High-occupancy vehicle parking. Where employee parking is provided for a building that has a *total building floor area* greater than 10,000 square feet (929 m²), a building occupant load greater than 100 and not less than 20 employees, at least 5 percent, but not less than two, of the employee parking spaces provided shall be designated as preferred parking for *high occupancy vehicles*. Preferred parking spaces required by this section shall be those in the parking facility that are located nearest the entrance, but shall not take precedence over parking spaces that are required to be accessible in accordance with the *International Building Code*. Where buildings have multiple entrances with adjacent parking, parking spaces required by this section shall be dispersed and located near the entrances.

407.4.2 Low-emission, hybrid, and electric vehicle parking. Where parking is provided for a building that has a *total building floor area* greater than 10,000 square feet (929 m²m²) and that has an *building occupant load* greater than 100, at least 5 percent, but not less than two, of the parking spaces provided shall be designated as preferred parking for low emission, hybrid, and electric vehicles.

Reason: Edmunds.com 2013 New Car Buying Guide (<http://www.edmunds.com/hybrid/before-buy.html>) says that generally hybrid vehicles can cost 20% more than comparable standard vehicles. This means that the code currently gives more desirable parking to people based upon their ability to pay more for their vehicle. This is elitist and inappropriate; the code should not bestow advantages upon people because of their economic standing. Note that the code does not prevent an owner from providing preferred parking voluntarily.

Cost Impact: Will increase the cost of construction.

GG151-14: 407.4-JOHNSON151

GG152-14

407.4.2

Proponent: Steven Rosenstock, representing Edison Electric Institute
(srosenstock@eei.org)

Revise as follows:

407.4.2 Low-emission, hybrid, and electric vehicle parking. Where parking is provided for a building that has a *total building floor area* greater than 10,000 square feet (929 m²) and that has an building occupant load greater than 100, at least 5 percent, but not less than two, of the parking spaces provided shall be designated as preferred parking for low emission, hybrid, and electric vehicles that have a combined city/highway fuel economy rating of not less than 40 MPG or 40 MPGe.

Reason: Many vehicles that qualify as a low-emission or hybrid vehicle do not have the highest fuel economy. This revision will ensure that vehicles that have low emissions and higher fuel economy get the preferred parking at green buildings.

In terms of enforcement, only the signs by the spaces would have to change to show that only vehicles that have been rated by EPA to obtain at least 40 MPG or 40 MPGe are allowed to park in the designated spaces.

Information about fuel economy is readily available at www.fueleconomy.gov for vehicles that were manufactured from 1984 to the present day.

Cost Impact: Will increase the cost of construction. The signs used for these parking spots may need to be increased in size to add the extra text about the new 40 MPG/MPGe requirement.

GG152-14: 407.4.2-ROSENSTOCK493

GG153-14

407.4.2.1 (New)

Proponent: Wayne Stoppelmoor, representing Schneider Electric
(wayne.stoppelmoor@schneider-electric.com)

Add new text as follows:

407.4.2.1 Electric vehicle parking charging stations. Where 250 or more parking spaces are provided for a *building project* that has a *total building floor area* of 100,000 square feet or more, electric vehicle charging stations shall be provided. Where required, the number of charging stations shall be not less than 1 percent of the number of parking spaces provided.

Reason: The number of plug-in electric vehicles (PEV) on the road continues to grow at a significant rate. However, the lack of public PEV charging stations is a barrier to the most efficient use of PEVs. This requirement is needed to establish a minimum infrastructure requirement to meet the growing demand for public electric vehicle charging stations. Installing PEV charging infrastructure during the time of construction establishes a substantial cost savings as compared to installing such infrastructure in the future. This requirement targets only high occupancy parking facilities where there is a high probability an electric vehicle will visit and require further charge to complete their travel.

Cost Impact: Will increase the cost of construction. This requirement will have minimal cost impact at the time of construction. The cost impact is substantially less than if PEV charging stations were to be installed after the building project is completed. Additionally, this requirement is written in a manner that will have no cost impact on small businesses as small parking areas are exempt from this requirement.

GG153-14: CHAPTER 4-STOPPELMOOR1052

GG154-14

202 (New), 407.4.3 (New)

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)

Add new definition as follows:

SECTION 202 **DEFINITIONS**

ALTERNATIVE FUEL VEHICLE. A dedicated, flexible fuel, or dual-fuel vehicle designed to operate on at least one alternative fuel, such as biodiesel (B100), natural gas and liquid fuels domestically produced from natural gas, propane (liquefied petroleum gas), electricity, hydrogen, blends of 85% or more of methanol, denatured ethanol, other alcohols with gasoline or other fuels, coal-derived and domestically produced liquid fuels, fuels (other than alcohol) derived from biological materials, and P-Series fuels.

Add new text as follows:

407.4.3 Alternative fuel vehicle refueling or recharging station. Where parking is provided for a building that has a *total building floor area* of more than 10,000square feet (929 m) and that has an *building occupant load* greater than 100, at least one refueling or recharging station that can provide alternative fuel to not less than two *alternative fuel vehicles* shall be installed.

Reason: This new section will provide another option that will reduce the energy and environmental impacts of transporting people, products, and services to green buildings. Allowing the option of providing refueling or recharging infrastructure will encourage the occupants of green buildings to drive vehicles that use alternative fuels.

The use of alternative fuels has many positive impacts for the United States. For many years, the US imported over 10 Million barrels of crude oil every day. At \$100 per barrel, that meant that \$1 Billion was being sent to other countries every day of the year (or \$365 Billion per year). With reduced imports due to higher fuel economy and increased domestic production, the US is still importing over 7 million barrels per day, at a cost of \$700 Million per day (assuming \$100 per barrel).

Many buildings are already providing refueling / recharging stations for their employees, visitors, or tenants. This new requirement will provide more options to code officials and building owners and designers to help mitigate the impact of transportation associated with green buildings.

The new definition ALTERNATIVEFUEL VEHICLES will improve the code and allow for more options by the building owners and designers.

The definition was created by the US government as part of the Energy Policy Act of 1992 (EPACT 1992). It can be located at the following US Department of Energy web site:
<http://www.afdc.energy.gov/glossary.html>

The use of alternative fueled vehicles has been increasing dramatically over the past several years, as indicated by the fact that there are now over 150,000 plug-in electric vehicles (plug-in hybrids or all-electric) being driven on US roads today.

In addition, as shown in the *Wall Street Journal* article of November 5, 2013 entitled "More Commuters Go It Alone", the percentage of American workers age 16 and over who drive alone to work has increased from 64.4% in 1980 to 76.3% in 2012. Provisions in this code that encourage the use of such vehicles will have significant national benefits.

Cost Impact: Will increase the cost of construction. The cost of refueling / recharging stations is directly proportional to the number of stations, the number of vehicles that can be served, and the energy infrastructure needed to serve the maximum number of vehicles that can use the stations.

GG154-14: 407.4.3 (NEW)-ROSENSTOCK494

GG155-14

302.1, 407.4, 407.4.3 (New)

Proponent: Marilyn Williams, representing NEMA (mar_williams@nema.org)

Revise as follows:

302.1 Requirements determined by the jurisdiction.

The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 1. SCOPE AND ADMINISTRATION			
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
101.3 Exception 1.2	CHAPTER 4. SITE DEVELOPMENT AND LAND USE	<input type="checkbox"/> Yes	<input type="checkbox"/> No
101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 4. SITE DEVELOPMENT AND LAND USE			
402.2.1	Flood hazard area preservation, general	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.2.2	Flood hazard area preservation, specific	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.3	Surface water protection	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
402.5	Conservation area	<input type="checkbox"/> Yes	<input type="checkbox"/> No
402.7	Agricultural land	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
402.8	Greenfield sites	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.1	High-occupancy vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
407.4.2	Low-emission, hybrid and electric vehicle parking	<input type="checkbox"/> Yes	<input type="checkbox"/> No

407.4.3	Electric vehicle charging stations	<input type="checkbox"/> Yes	<input type="checkbox"/> No
409.1	Light pollution control	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY			
503.1	Minimum percentage of waste material diverted from landfills	50% 65% 75%	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION			
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: ____ zEPI: _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 7. WATER RESOURCE CONSERVATION, QUALITY AND EFFICIENCY			
702.7	Municipal reclaimed water	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT			
804.2	Post-Construction Pre-Occupancy Baseline IAQ Testing	<input type="checkbox"/> Yes	<input type="checkbox"/> No
807.1	Sound transmission and sound levels	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post Certificate of Occupancy zEPI, energy demand, and CO ₂ e	<input type="checkbox"/> Yes	<input type="checkbox"/> No

407.4 Preferred vehicle parking. Where either Section 407.4.1 or 407.4.2 is indicated to be applicable in Table 302.1, parking provided at a building site shall comply with this section. Preferred parking spaces required by this section shall be those in the parking facility that are located on the shortest route of travel from the parking facility to a building entrance, but shall not take precedence over parking spaces that are required to be accessible in accordance with the *International Building Code*. Where buildings have multiple entrances with adjacent parking, parking spaces required by this section shall be dispersed and located near the entrances. Such parking spaces shall be provided with *approved* signage that specifies the permitted usage.

Add new text as follows:

407.4.3 Electric vehicle charging stations. Where 250 or more parking spaces are provided for a building project that has a total building floor area of 100,000 square feet or greater, not less than 2 electric vehicle charging stations shall be provided. For each additional 100 parking spaces greater than 250, an additional electric vehicle charging station shall be provided.

Reason: The number of plug-in electric vehicles (PEV) on the road continues to grow at a significant rate. However, the lack of public PEV charging stations is a barrier to the most efficient use of PEVs. This requirement is needed to establish a minimum infrastructure requirement to meet the growing demand for public electric vehicle charging stations. Installing PEV charging infrastructure during the time of construction establishes a substantial cost savings as compared to installing such infrastructure in the future. This requirement targets only high occupancy parking facilities where there is a high probability an electric vehicle will visit and require further charge to complete their travel.

Cost Impact: Will not increase the cost of construction. This requirement will have minimal cost impact on larger parking facilities at the time of construction; and the cost impact is substantially less than if PEV charging stations were to be installed after the building project is completed. This requirement is also written in a manner that will have no cost impact on small businesses, since small parking areas are exempt from this requirement.

GG155-14: 407.4.3 (NEW)-WILLIAMS1024

GG156-14

408.2.1

Proponent: Heather Dylla (hdylla@asphaltpavement.org)

Delete without substitution:

~~**408.2.1 Site hardscape materials.** Hardscape materials shall have an initial solar reflectance value of not less than 0.30 in accordance with ASTM E 1918 or ASTM C 1549.~~

~~**Exception:** The following materials shall be deemed to comply with this section and need not be tested:~~

- ~~1. Pervious and permeable concrete pavements.~~
- ~~2. Concrete paving without added color or stain.~~

Reason: The scientific evidence supporting the impact or effect of increasing hardscape albedo on mitigating Urban Heat Island (UHI) is extremely limited, therefore making it premature to specify reflective hardscapes as a strategy for UHI mitigation in green building construction codes. The predominant engineered traffic-bearing hardscape material is pavement. Recommending increased albedo for engineered pavement systems overlooks a history of almost 100 years of complex engineering design characteristics. The purported environmental benefits of reflective hardscapes eliminate major commercial markets of certain pavement materials, while disregarding other environmental benefits of certain materials such as recyclability and durability. Recognizing the potential for adverse impacts from specifying reflective pavements, other green rating systems, such as Federal Highway Administration (FHWA) Invest have eliminated this credit (See Background Information at <http://www.fhwa.dot.gov/research/tfhrc/projects/projectsdb/projectdetails.cfm?projectid=FHWA-PROJ-13-0018>.) The 408.2.1 current IgCC code section should be removed.

Much of the scientific evidence recommending an increase in material albedo for UHI mitigation is merely modeled from roofing data and has not been validated for pavements. Roofs and pavements are distinctly different materials. Endeavors that apply the same principles to pavements overlook the complexities of urban geography, including how ground-level reflections interact with pedestrians, vehicles, and the built environment. Heat concentration in urban areas is a multifaceted and context-specific problem; it requires a solution that looks at more than just one mitigation strategy and recognizes each strategy's potential negative consequences.

Specifically, a number of researchers have documented adverse unintended consequences from increasing pavement reflectivity, including increased reflected solar radiation heating-up adjacent buildings, potential for increased UV radiation, heating up the atmosphere, increased light pollution, and a host of other adverse environmental impacts. Recently, researchers from Arizona State University, surveyed a wide range of current published research on pavement reflectivity and summarized their findings in the report "Unintended Consequences: A Research Synthesis Examining the Use of Reflective Pavements to Mitigate the Urban Heat Island Effect." A copy of the report can be downloaded from the ASU National Center for SMART Innovations website at <http://ncesmart.asu.edu/news/unintended-consequences>.

For reason, it is premature to suggest an increased hardscape albedo to mitigate UHI. This section as it stands is based on non-validated engineering and sustainability principles. Therefore, Section 408.2.1 should be stricken and removed.

Bibliography:

Quantifying Pavement Albedo Project Background. Eric Weaver, Ph.D. Federal Highway Agency. 2012. Available online at: <http://www.fhwa.dot.gov/research/tfhrc/projects/projectsdb/projectdetails.cfm?projectid=FHWA-PR OJ-13-0018>

Unintended Consequences: A Research Synthesis Examining the Use of Reflective Pavements to Mitigate the Urban Heat Island Effect. Jiachuan Yang; Zhihua Wang, Ph.D.; and Kamil E. Kaloush, Ph.D., P.E. 2013. Available online at: <http://ncesmart.asu.edu/news/unintended-consequences>

Cost Impact: Will not increase the cost of construction. This change does not impact cost of construction.

GG156-14: 408.2.1-DYLLA503

GG157-14

408.2.1

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV,
Chair, Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

408.2.1 Site hardscape materials. Hardscape materials shall have an initial solar reflectance value of not less than 0.30 in accordance with ASTM E 1918 or ASTM C 1549.

Exception: ~~The following materials~~ Concrete paving without added color or stain shall be deemed to comply with this section and need not be tested:

- ~~1. Pervious and permeable concrete pavements.~~
- ~~2. Concrete paving without added color or stain.~~

Reason: Exception 1 to Section 408.2.1 should be deleted because it should not automatically be assumed that all permeable pavement and pavers have a low albedo. For example, dark stains could be added to permeable pavement or the pavement could be naturally dark.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG157-14: 408.2.1 #1-THOMPSON298

GG158-14

408.2.1

Proponent: Jason Thompson, Clark County Development Services, representing NCMA/MACS (jthompson@ncma.org)

Revise as follows:

408.2.1 Site hardscape materials. Hardscape materials shall have an initial solar reflectance value of not less than 0.30 in accordance with ASTM E 1918 or ASTM C 1549.

Exception: The following materials shall be deemed to comply with this section and need not be tested:

1. Pervious and permeable ~~concrete~~ pavements.
2. Concrete paving without added color or stain.

Reason: Pervious and permeable pavement systems are not limited solely to concrete pavements, but could include materials such as stone and clay-based materials and open grid pavers intended for pedestrian and light vehicular traffic. This modification captures the original intent of this exception by making it material independent.

Cost Impact: Will not increase the cost of construction.

GG158-14: 408.2.1 #2-THOMPSON874

GG159-14

408.2.4

Proponent: Heather Dylla, representing National Asphalt Pavement Association
(hdylla@asphaltpavement.org)

Revise as follows:

408.2.4 Pervious and permeable Permeable pavement. ~~Pervious and permeable Permeable~~ pavements including open grid paving systems and open-graded asphalt, concrete and aggregate systems shall have a ~~percolation rate~~ percent air void of not less than ~~2 gallons per minute per square foot (100 L/min ~ m2)~~ 15 percent. ~~Pervious and permeable Permeable~~ pavement shall be permitted where the use of these types of hardscapes does not interfere with fire and emergency apparatus or vehicle or personnel access and egress, utilities, or telecommunications lines. ~~Aggregate used shall be of uniform size.~~

Reason: Recent research has identified that permeable pavements can mitigate urban heat island (UHI) effect due to their high air void nature. Furthermore, these pavement systems can reduce stored pavement energy which also helps mitigate the UHI effect. Permeable pavements have an insulating capacity that allows for rapid cooling via evaporation due to their air voids structure (Kevern 2012). The code section 408.2.4, as written, identifies permeable pavements as a strategy to mitigate UHI but sets a minimum percolation rate as the criterion to qualify. However, the percolation rate of permeable pavements is not commonly tested due to limitations in current test procedures (FHWA). In fact, due to the test procedures' ambiguous results, percolation rate metrics are rarely, if ever, used as a requirement for permeable pavement installation. Instead, the most common metric used to specify permeable pavements is percent air voids. Typical permeable pavements have approximately 15%-20% air voids which allow pavement strength for heavy traffic while still allowing ample rainwater percolation and evaporation (FHWA, EPA). Measuring the amount of air voids is a common analysis following ASTM C1688 for pervious concrete and ASTM D6752 or ASTM D3203 for porous asphalt (FHWA, APAI).

In addition, to keep wordage consistent, eliminate the term pervious pavements and use only permeable pavements. The statement "aggregate used shall be a uniform size" is unclear. Permeable pavements use an aggregate structure that is open-graded meaning the aggregates are of near uniform size with little or no fine particles. Recommend removing this sentence. The air void requirement will ensure the use of near uniform aggregate sizes. The definition for permeable pavement as stands is not clear to users that this includes pervious concrete and porous asphalt mixtures. Therefore, suggest revising current definition to: open-graded asphalt, concrete, and aggregate systems.

Bibliography:

"Hot Weather Comparative Heat Balances in Pervious Concrete and Impervious Concrete Pavement Systems." Journal of Heat Island Institute International Vol. 7-2. Kevern, J.T., Haselback, L. and Schaefer, V.R. 2012. 231-237.

"Porous Asphalt Pavement." Environmental Protection Agency (EPA). 2009. Available Online at: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=135>

"Tech Brief: Pervious Concrete." Federal Highway Association (FHWA). 2012. Available Online at: <http://www.fhwa.dot.gov/pavement/concrete/pubs/hif13006/index.cfm>

"Porous Asphalt." Asphalt Pavement Association. (2009). Available Online at: <http://www.asphaltindiana.org/docs/2009%20Porous%20Asphalt%20Spec.pdf>

Cost Impact: Will not increase the cost of construction.

GG159-14: 408.2.4-DYLLA1005

GG160-14

202 (New), 408.2.4

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Delete without substitution:

SECTION 202 DEFINITIONS

~~**PERVIOUS CONCRETE.** Hydraulic cement concrete with distributed, interconnected macroscopic voids that allows water to pass through the material with little resistance.~~

Add new definition as follows:

SECTION 202 DEFINITIONS

PERMEABLE PAVEMENT. Pavement constructed of materials that allow water to pass through.

Revise as follows:

~~**408.2.4 Pervious and Permeable pavement.** Pervious and Permeable pavements including open grid paving systems and open-graded aggregate systems shall have a percolation rate of not less than 2 gallons per minute per square foot (100 L/min × m²). Pervious and Permeable pavement shall be permitted where the use of these types of hardscapes does not interfere with fire and emergency apparatus or vehicle or personnel access and egress, utilities, or telecommunications lines. Aggregate used shall be of uniform size.~~

Reason: Section 202 contains a definition for pervious concrete, as regulated by Section 408.2.4, but lacks a definition of 'permeable pavement'. The intent of adding this definition is for consistency and clarity. The proposed definition uses the same basic definition contained in 'pervious concrete' but without the reference to concrete so as not to conflict with that definition. This proposal further simplifies the definition so that it would apply to, and the code would allow compliance with, more types of paving materials. Note that Section 408.2.4 contains requirements for the amount of water that must be allowed to pass through permeable pavement and at what rate. As separate proposal by the SEHPCAC deletes the definition of "pervious concrete" and the term "pervious" from Section 408.2.4.

The term "pervious" is proposed to be deleted here because the term "permeable pavement" includes pervious. Pervious concrete is defined in Chapter 2 of the IgCC, but that specific term is not used anywhere in the code. Therefore, this proposal also deletes the definition of "pervious concrete."

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG160-14 : 408.2.4 #1-THOMPSON308

GG161-14

408.2.4

Proponent: Jason Thompson, representing NCMA/MACS (jthompson@ncma.org)

Revise as follows:

408.2.4 Pervious pavement and permeable unit pavement. Pervious pavement and permeable unit pavements including open grid paving systems and open-graded aggregate systems shall have an infiltration ~~percolation~~ rate not less than 2 gallons per minute per square foot (100 L/min × m²). The infiltration rate for pervious pavement shall be determined by testing in accordance with ASTM C1701/C1701M. The infiltration rate for permeable unit pavement shall be determined by testing in accordance with ASTM C1781/C1781M. Pervious pavement and permeable unit pavement shall be permitted where the use of these types of hardscapes does not interfere with fire and emergency apparatus or vehicle or personnel access and egress, utilities, or telecommunications lines. Aggregate used shall be open-graded to allow the pavement to comply with the infiltration rate of uniform size.

Add new standard(s) as follows:

ASTM

C1701/C1701M-09, Standard Test Method for Infiltration Rate of In Place Pervious Concrete

C1781/C1781M-13, Standard Test Method for Surface Infiltration Rate of Permeable Unit Pavement Systems

Reason: This modification 1) defines the testing procedures to be used when evaluating the infiltration rate of pervious and permeable pavements for consistent evaluation and qualification; 2) corrects terminology that the test is used to determine an "infiltration rate" instead of a "percolation rate" as infiltration rate is a more accurate method of evaluating a pavement's surface; and 3) requires aggregate used for these pervious and permeable unit pavements to be "open-graded" instead "of uniform size." Open-graded aggregate is the term commonly used for aggregates in pervious and permeable unit pavements. Some open-graded aggregate include more than one size stone or aggregate. For instance, a common base material for permeable unit pavement is washed No. 57 "stone" or aggregate which consists primarily of two (2) stone or aggregate sizes approximately ½ to 1 in. (13 to 25 mm) in size. As long as the aggregate are open-graded to the extent that they allow the pavement system to comply with the pavement infiltration rate, they should be permissible for use with pervious and permeable unit pavement systems.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code section C402.3 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section number for the 2015 Editions will be C402.4.

GG161-14: 408.2.4 #2-THOMPSON875

GG162-14

408.3

Proponent: Jay Crandell, ARES Consulting, representing EPDM Roofing Association (jcrandell@aresconsulting.biz)

Revise as follows:

408.3 Roof surfaces. Not less than 75 percent of the roof surfaces of buildings and covered parking located in climate zones 1 through 3, as established in the *International Energy Conservation Code*, shall be a roof complying with Section 408.3.1; shall be covered with a vegetative roof complying with Section 408.3.2; or a combination of these requirements. The provisions of this section shall apply to roofs of structures providing shade to parking in accordance with Section 408.2.2 where located in climate zones 1 through 6.

Exception: Portions of roof surfaces occupied by the following shall be permitted to be deducted from the roof surface area required to comply with this section:

1. Solar thermal collectors.
2. Solar photovoltaic systems.
3. Roof penetrations and associated equipment.
4. Portions of the roof used to capture heat for building energy technologies.
5. Rooftop decks and rooftop walkways.
6. Ballasted roofs with a minimum stone ballast of 17 lb/ft² or 23 lb/ft² for pavers.

Reason: The added exception is based on an identical exception in ASHRAE 90.1. This exception is based on comparative study of the performance of reflective and ballasted roofs conducted by DOE/ORNL (see bibliography). While ballasted roofs can provide equivalent energy performance, they also carry durability benefits, provide modest solar reflectance and high emittance, tend to shift peak load demand, are often used in combination with vegetative roofs, are used to create roof-top outdoor space, and can provide a non-negligible contribution to storm water retention and peak flow reduction for frequent small rain events (see bibliography).

Bibliography:

Desjarlais, A.O., Petrie, T.W., and Atchley, J.A. (2007). Modeling the Thermal Performance of Ballasted Roof Systems, Buildings X, ASHRAE, Atlanta, GA

Hoff, J.L. (2008). New Heat Mitigation and Water Retention Concepts to Expand Green Roofing Demand. Seventh Annual Green Rooftops for Sustainable Communities Conference, Atlanta, GA

Cost Impact: Will not increase the cost of construction.

GG162-14: 408.3-CRANDELL1034

GG163-14

408.3

Proponent: Amy Dickie, representing Global Cool Cities Alliance (amy@globalcoolcities.org)

Revise as follows:

408.3 Roof surfaces. Not less than 75 percent of the roof surfaces of buildings and covered parking located in climate zones ~~1 through 3~~, 1, 2, 3, 4a and 4b, as established in the *International Energy Conservation Code*, shall be a roof complying with Section 408.3.1; shall be covered with a vegetative roof complying with Section 408.3.2; or a combination of these requirements. The provisions of this section shall apply to roofs of structures providing shade to parking in accordance with Section 408.2.2 where located in climate zones 1 through 6.

Exception: Portions of roof surfaces occupied by the following shall be permitted to be deducted from the roof surface area required to comply with this section:

1. Solar thermal collectors.
2. Solar photovoltaic systems.
3. Roof penetrations and associated equipment.
4. Portions of the roof used to capture heat for building energy technologies.
5. Rooftop decks and rooftop walkways.

Reason: This proposal modifies Section 408.3 of Chapter 4 of the International Green Construction Code (IgCC) to expand the roof surfaces requirement to climate zones 4a and 4b. IgCC is a code which provides building construction and operations which should be more sustainable than buildings constructed under the IECC, IBC, IMC or IPC alone. Therefore, the roof surfaces requirements and should go above and beyond those required in the IECC and should take into account the urban heat island reduction benefits provided by both vegetative roofs and reflective roofs. Both vegetative roofs and reflective roofs have been proven to provide a number of benefits in climate zones 4a and 4b.

- Switching to reflective roofs across climate zones 4a and 4b generates net energy savings and net energy cost savings.
- Reflective roofs help reduce peak energy load in IECC climate zones 4a and 4b.
- The benefits of reflective roofs have been proven beneficial in major metropolitan areas within climate zones 4a and 4b. Several major cities in climate zone 4 have adopted the use of reflective roofs on commercial, low-sloped roofs into law.
- Reflective roofs provide a cooler environment for roof equipment, thus enabling better performance for rooftop equipment.
- In most cases roof construction can have a reflective roof option with zero price premium.
- Reflective roofs and vegetative roofs have many important benefits beyond building energy. Both reflective and vegetative roofs reduce the summer air temperature in cities and therefore improve resiliency of urban populations to heat events. Vegetative roofs help control storm water run-off.

Cost Impact: Will not increase the cost of construction.

GG163-14: 408.3-DICKIE798

GG164-14

408.3.1.2, 408.3, 408.3.1.1, 408.3.1

Proponent: Mike Fischer, representing The Asphalt Roofing Manufacturers Association
(mfischer@kellenccompany.com)

Delete without substitution:

~~**408.3.1.2 Solar reflectance index.** Roof products shall be permitted to use a solar reflectance index (SRI) where the calculated value is in compliance with Table 408.3.1 values for minimum aged SRI. The SRI value shall be determined using ASTM E 1980 with a convection coefficient of 2.1 Btu/h-ft² (12 W/m² × k) based on three-year aged roof samples tested in accordance with the test methods in Section 408.3.1.1.~~

Revise as follows:

408.3 Roof surfaces. Not less than 75 percent of the roof surfaces of buildings and covered parking located in climate zones 1 through 3, as established in the *International Energy Conservation Code*, shall be a roof complying with Section 408.3.1; shall be covered with a vegetative roof complying with Section 408.3.12; or a combination of these requirements. The provisions of this section shall apply to roofs of structures providing shade to parking in accordance with Section 408.2.2 where located in climate zones 1 through 6.

Exception: Portions of roof surfaces occupied by the following shall be permitted to be deducted from the roof surface area required to comply with this section:

1. Solar thermal collectors.
2. Solar photovoltaic systems.
3. Roof penetrations and associated equipment.
4. Portions of the roof used to capture heat for building energy technologies.
5. Rooftop decks and rooftop walkways.
6. Roof coverings that comply with Section 605.2.

Delete without substitution:

~~**408.3.1.1 Roof products testing.** Roof products shall be tested for a minimum three-year aged solar reflectance in accordance with ASTM E 1918, ASTM C 1549 or the CRRG 1 Standard and thermal emittance in accordance with ASTM C 1371, ASTM E 408 or the CRRG 1 Standard, and shall comply with the minimum values in Table 408.3.1.~~

Revise as follows:

~~**408.3.1 605.2 Roof coverings—solar reflectance and thermal emittance.** Where roof coverings are used for compliance with Section 408.3, Roof coverings shall comply with Section 408.3.1.1 or 408.3.1.2. The values for solar reflectance and thermal emittance shall be determined by an independent laboratory accredited by a nationally recognized accreditation program. Roof products shall be listed and labeled and certified by the manufacturer demonstrating compliance. the roof reflectance requirements of the *International Energy Conservation Code*.~~

Delete without substitution:

**TABLE 408.3.1
REFLECTANCE AND EMITTANCE**

ROOF SLOPE	MINIMUM AGED SOLAR REFLECTANCE	MINIMUM AGED THERMAL EMITTANCE	MINIMUM AGED SRI
2:12 or less	0.55	0.75	60
Greater than 2:12	0.30	0.75	25

Reason: The site development requirements in Chapter 4 for roofing are flawed; they include a vegetative requirement trade-off for reflective roofing with a threshold of 75% of the building roof area. This disconnect creates a conflict with the IECC roof reflectance requirements. Roofing reflectance carries much greater benefits for reducing building loads in cooling-dominated regions. The science of heat island effects cannot properly assess how minute changes in roof reflectance changes surrounding building temperatures. The margin of error in computer models used to calculate such effects makes it difficult if not impossible to properly assess the role of reflective roofing. Furthermore, vegetative roofing can provide benefits to stormwater management in jurisdictions where stormwater and sanitary wastewater are processed in the same systems.

This proposal relocates the roofing reflectance requirement to Chapter 6 where it belongs. Cool roofs provide a greater and more tangible benefit to building owners when energy efficiency is the primary design motivation. Other proposals will address the design values; this sets the required level at the IECC baseline. Other proposals will address other site benefits of vegetative roofing.

Cost Impact: Will not increase the cost of construction.

GG164-14: 408.3-FISCHER1147

GG165-14

408.3

Proponent: Thomas Slabe, U.S. Environmental Protection Agency, representing USEPA, and Jennifer Boussetot, Colorado State University

Revise as follows:

408.3 Roof surfaces. Not less than 75 percent of the roof surfaces of buildings and covered parking located in climate zones 1 through 3 5, as established in the *International Energy Conservation Code*, shall be a roof complying with Section 408.3.1; shall be covered with a vegetative roof complying with Section 408.3.2; or a combination of these requirements. The provisions of this section shall apply to roofs of structures providing shade to parking in accordance with Section 408.2.2 where located in climate zones 1 through 6.

Exception: Portions of roof surfaces occupied by the following shall be permitted to be deducted from the roof surface area required to comply with this section:

1. Solar thermal collectors.
2. Solar photovoltaic systems.
3. Roof penetrations and associated equipment.
4. Portions of the roof used to capture heat for building energy technologies.
5. Rooftop decks and rooftop walkways.

Reason:

1. Heat-related morbidity and mortality is more prevalent during summer in the higher latitudes.
2. Mortality during heat waves is higher in the Northeast and Midwest than in the south. (Anderson and Bell 2011)
3. There are many cities that are leading the green roof industry that are in CZs 4 and 5.
4. The sun during summer months goes directly over CZs 4 and 5.
5. Cities in CZs 4 and 5 produce a lot of waste heat, perhaps as much waste heat from burning carbon as the amount of energy in sunlight per unit area.
6. The only way to mitigate heat waves is with urban forestry and green roofs.
7. The only way to expand vegetative coverage in dense urban areas in large northern cities is to utilize green roofs.
8. Because of urban heat island effects, there is a corresponding increase in ground-level ozone. Green roofs and urban forestry are the most readily available mitigation practices for reducing ground-level ozone, aside from eliminating the combustion of carbon fuels and refinement of oil products.
9. CZs 4 and five include cities that are at the leading edge in living architecture in N. America. Such cities include: Seattle, Sacramento, Salt Lake City, Denver, Cincinnati, Chicago, Washington, New York City, and Toronto. These are major urban centers that are subjected to severe heat waves at times. Heat waves are forecasted to become worse as climate change and global warming advances.

Cost Impact: Will increase the cost of construction.

GG165-14: 408.3-GITLIN813

GG166-14
408.3.1, Table 408.3.1

Proponent: Amy Dickie, representing Global Cool Cities Alliance
 (amy@globalcoolcities.org)

Revise as follows:

408.3.1 Roof coverings—solar reflectance and thermal emittance. Where roof coverings are used for compliance with Section 408.3, roof coverings shall comply with Section 408.3.1.1 or 408.3.1.2. The values for solar reflectance and thermal emittance shall be determined by an independent laboratory accredited by a nationally recognized accreditation program. Roof products shall be listed and labeled and certified by the manufacturer demonstrating compliance.

**TABLE 408.3.1
 REFLECTANCE AND EMITTANCE**

ROOF SLOPE	MINIMUM AGED SOLAR REFLECTANCE	MINIMUM AGED THERMAL EMITTANCE	MINIMUM AGED SRI
2:12 or less	0.55 <u>0.65</u>	0.75	60 <u>78</u>
Greater than 2:12	0.30	0.75	25

Reason: IgCC is a code which provides building construction and operations which should be more sustainable than buildings constructed under the IECC, IBC, IMC, or IPC alone.

Therefore, the roof reflectivity requirements included in Chapter 4 should match leading green codes. This proposal modifies the reflectivity requirements in Table 408.3.1 to increase the roof reflectivity requirements.

We believe that IgCC should achieve parity with the reflectivity requirements in leading green codes. The minimum solar reflectance and SRI values are consistent with the requirements in CalGreen Tier 2.

The increase in solar reflectance requirement proposed here would generate almost 30 percent additional energy savings benefit above the current requirements, compared with a base case. The following equation, provided by the Heat Island Group at Lawrence Berkeley National Laboratory, describes the increase in net annual energy savings from boosting the solar reflectance requirement from 0.55 to 0.65: $(0.65 - 0.20) / (0.55 - 0.20) - 1 = 29\%$. That is, if the albedo 0.55 roof saved 100 units of energy, the albedo 0.65 roof would save 129 units of energy.

This equation assumes that thermal emittance levels remain constant.

Cost Impact: Will not increase the cost of construction.

GG166-14: 408.3.1 #2-DICKIE799

GG167-14
408.3.1, Table 408.3.1

Proponent: Jay Johnson, Thomas Associates, Inc. / Metal Building Manufacturers Association, representing Thomas Associates, Inc., representing Metal Building Manufacturers Association (jjohnson@thomasamc.com)

Revise as follows:

408.3.1 Roof coverings—solar reflectance and thermal emittance. Where roof coverings are used for compliance with Section 408.3, roof coverings shall comply with Section 408.3.1.1 or 408.3.1.2. The values for solar reflectance and thermal emittance shall be determined by an independent laboratory accredited by a nationally recognized accreditation program. Roof products shall be listed and labeled and certified by the manufacturer demonstrating compliance.

TABLE 408.3.1
REFLECTANCE AND EMITTANCE^a

ROOF SLOPE	MINIMUM AGED SOLAR REFLECTANCE	MINIMUM AGED THERMAL EMITTANCE	MINIMUM AGED SRI
2:12 <u>1:12</u> or less	0.55	0.75	60
Greater than 2:12	0.30	0.75	25

a. Linear interpolation shall be allowed between 1:12 and 2:12.

Reason: The roof slope of 2:12 or less, as provided in Table 408.3.1, has been modified to 1:12 or less. A new footnote has been proposed as follows: a. Linear interpolation shall be allowed between 1:12 and 2:12.

The 2:12 breakpoint between low- and steep slope roofs at 2:12 is an arbitrary limit based on visibility of the roof from ground level. An instantaneous break point such as this allows for a 2.01:12 roof slope to be quite different in terms of performance of an exactly 2:12 roof, when in fact there is no difference in their impact as a cool roof. It also opens the code requirements to gamesmanship. This proposal allows linear interpolation to be applied between two limits: 1:12 and 2:12 to eliminate the instantaneous break. Doing this also allows colors and finishes that are good performers but don't necessarily meet the low slope requirements, to be used at lower roof slopes. This latter point is significant because whether a roof is visible from a certain vantage point varies widely by siting and could be far less or more than 2:12. By introducing a region in which the requirements transition smoothly, colors and finishes that are fair but not bright white can be utilized when a roof flatter than 2:12 is visible and a bright white roof is not visually acceptable or would cause issues with glare.

Cost Impact: Will not increase the cost of construction.

GG167-14: TABLE 408.3.1-JOHNSON926

GG168-14

408.3.1, Table 408.3.1, 408.3.1.1, 408.3.1.2, 408.3.1.3 (New)

Proponent: Amy Dickie, Global Cool Cities Alliance, representing Global Cool Cities Alliance (amy@globalcoolcities.org)

Revise as follows:

408.3.1 Roof coverings—solar reflectance and thermal emittance. Where roof coverings are used for compliance with Section 408.3, roof coverings shall comply with ~~Section~~ Sections 408.3.1.1, ~~or~~ 408.3.1.2, and 408.3.1.3. ~~The values for solar reflectance and thermal emittance shall be determined by an independent laboratory accredited by a nationally recognized accreditation program. Roof products shall be listed and labeled and certified by the manufacturer demonstrating compliance.~~

**TABLE 408.3.1
REFLECTANCE AND EMITTANCE**

ROOF SLOPE	MINIMUM AGED SOLAR REFLECTANCE	MINIMUM AGED THERMAL EMITTANCE	MINIMUM AGED SRI
2:12 or less	0.55	0.75	60
Greater than 2:12	0.30	0.75	25

408.3.1.1 Roof products testing. Roof products shall be tested for a ~~minimum~~ three-year aged solar reflectance in accordance with ASTM E 1918, ASTM C 1549 or the CRRC-1 Standard and tested for thermal emittance in accordance with ASTM C 1371, ASTM E 408 or the CRRC-1 Standard, and shall comply with the minimum values in Table 408.3.1. Solar reflectance and thermal emittance values shall be determined by an independent laboratory accredited by a nationally recognized accreditation program. Roof products shall be listed and labeled certified by the manufacturer demonstrating compliance.

408.3.1.2 Solar reflectance index. ~~Roof products shall be permitted to use a solar reflectance index (SRI) where the calculated value is in compliance with Table 408.3.1 values for minimum aged SRI. The roof product's solar reflectance index SRI value shall be determined using ASTM E 1980 with a convection convective coefficient of 2.1 Btu/h-ft² (12 W/m²·k), based on corresponding to a medium wind speed condition. The aged solar reflectance index shall be computed from three-year aged roof samples tested values of solar reflectance and thermal emittance determined in accordance with the test methods in Section 408.3.1.1.~~

408.3.1.3 Solar reflectance and thermal emittance requirements. Roof products shall have minimum aged solar reflectance and minimum aged thermal emittance in accordance with Table 408.3.1, or minimum aged solar reflectance index in accordance with Table 408.3.1.

Reason: Section 408.3.1 has three purposes: (a) to specify the testing requirements for the solar reflectance and thermal emittance properties of roof products; (b) to specify how solar reflectance index (SRI) is to be determined; and (c) to specify the requirements for the solar reflectance and the thermal emittance, or for the SRI, of roof products. This proposal clarifies each of these specifications by addressing the issues listed below. **Problem:** Currently, Section 408.3.1 includes language that is specific to the testing requirements of roof products. That language should be in the Roof products testing section (Section 408.3.1.1). **Solution:** Move the language addressing testing requirements that is currently in Section 408.3.1 to Section 408.3.1.1 (Roof products testing).

Problem: The current definition of the convective coefficient for calculating SRI is incorrect (wrong units, ambiguous arithmetic) and does not specify a wind speed.

Solution: This proposal corrects the definition of the convective coefficient.

Problem: The current code language does not clearly specify how the values in Table 408.3.1 are to be used.

Solution: This proposal adds Section 408.3.1.3 to clarify that compliance can be achieved by meeting minimum values of solar reflectance and thermal emittance, or by meeting a minimum value of SRI. This change is in line with the structure of section C402.2.1.1 in the *International Energy Conservation Code*.

Cost Impact: Will not increase the cost of construction.

GG168-14: 408.3.1 #1-DICKIE795

GG169-14

408.3.1.1, Chapter 12

Proponent: Bob Zabcik, NCI Group, Inc., representing Cool Metal Roofing Coalition (CMRC)
(bobz@ncilp.com)

Revise as follows:

408.3.1.1 Roof products testing. Roof products shall be tested for a minimum three-year aged solar reflectance in accordance with ASTM E 1918, ASTM C 1549 or the CRRC-1 Standard and thermal emittance in accordance with ASTM C 1371, ASTM E 408 or the CRRC-1 Standard, and shall comply with the minimum values in Table 408.3.1. Testing shall be conducted on samples aged for not less than three years in accordance with ASTM G-7 or CRRC-1 on test farms that are accredited by a nationally recognized accreditation program in at least three different climates: Hot/Humid, Cold/Temperate and Hot/Dry, as described in CRRC-1.

Add new standard(s) as follows:

ASTM

ASTM G7/G7M-13, Standard Practice for Atmospheric Environmental Exposure Testing of Nonmetallic Materials.

Reason: The ASTM test methods currently specified in 408.3.1.1 are not equivalent methods of compliance compared to the CRRC-1 Standard and as such do not represent the current standard of care in the roofing industry. ASTM E 1918 and ASTM C 1549 are the same test methods that the CRRC-1 Standard utilizes for solar reflectance. In addition, ASTM C 1371 and ASTM E 408 are the same test methods CRRC-1 used for thermal emittance. However, CRRC-1 also includes extensive detailed language on the aging process itself, which if a user elects to test to the ASTM standards directly, will be circumvented. Specifically, The ASTM methods by themselves do not have any particular exposure/mounting specifications or aging process requirements, nor do they specify specimen aging in multiple climates as the CRRC-1 Standard does. If the intent of naming the methods directly is to provide an alternate compliance path by listing the test methods directly, then ASTM G 7 must also be referenced because it is the standard CRRC-1 builds upon to specify the exposure configuration.

Without the changes identified in this proposal, the only requirements for aging are the words "three-year aged", which alone do not provide a sufficient level of detail to ensure the solar reflectance and thermal emittance values to be consistent throughout all products. As is, compliance via the ASTM methods alone lacks any information on the following:

- Mounting configuration
- Exposure conditions
- Identification of climates for purposes of consistent aging
- Required number of test farms to be used
- Required number of samples to be aged and tested

The proposed changes address all of these points and provide the minimal level of detail that will make compliance via the ASTM test methods consistent with the CRRC-1 Standard, providing a consistent set of requirements while still allowing multiple methods of compliance.

Cost Impact: Will not increase the cost of construction.

GG169-14: 408.3.1.1-ZABCIK583

GG170-14

408.3.2

Proponent: Thomas Slabe, USEPA, representing USEPA and Jennifer Bousset, Colorado State University

Revise as follows:

408.3.2 Vegetative roofs. Vegetative roofs, where provided in accordance with Section 408.3, shall comply with the following:

1. All plantings shall be selected and placed in accordance with the following
 - 1.1 Plantings shall be selected based on their hardiness zone classifications in accordance with USDA MP1475 and shall be capable of withstanding the climate conditions of the jurisdiction and the micro climate conditions of the building site including, but not limited to, wind, precipitation and temperature. ~~Planting density shall provide foliage coverage, in the warm months, of not less than 80 percent within two years of the date of installation unless a different time period is established in the approved design. Plants shall be distributed to meet the coverage requirements.~~ Invasive plant species shall not be planted.
 - 1.2 Plants shall be selected and placed to provide foliage coverage of not less than 50 percent within two years of the date of installation;
 - 1.3 Construction documents shall be submitted that show the planting location and anticipated two-year foliage coverage of the plantings; and
 - 1.4 Coverage calculations shall be shown on the construction documents demonstrating compliance with this section and shall include only those areas that will be directly beneath the plants within a two-year growth period. Duplicate coverage credit shall not be granted for those areas where multiple plants cover the same area.
2. The engineered soil medium shall be designed for the physical conditions and local climate to support the plants and shall consist of nonsynthetic materials. The planting design shall include measures to protect the engineered soil medium until the plants are established. Protection measures include, but are not limited to, installation of pregrown vegetated mats or modules, tackifying agents, fiber blankets and reinforcing mesh. The maximum wet weight and water holding capacity of an engineered soil medium shall be determined in accordance with ASTM E 2399.
3. Where access to the building facades is provided from locations on the perimeter of the roof, nonvegetated buffers adequate to support associated equipment and to protect the roof shall be provided.
4. Nonvegetated clearances as required for fire classification of vegetative roof systems shall be provided in accordance with the *International Fire Code*.
5. Plantings shall be capable of being managed to maintain the function of the vegetative roof as provided in the documents required by Section 904.3.

Reason: This proposal aims to correct a number of problems with the requirements in this section, including:

The specified time period of "the warm months" requires a definition. Unfortunately, such a definition could be difficult to write, as "the warm months" vary greatly from location to location. Moreover, it is not clear what the authors intended with those words. (The three warmest months of the year in the given region? All months when the average temperature is above 75°F in that region?)

The foliage coverage requirement would demand that a building official visit the site two years after the plant installation in order to ensure that the required foliage coverage had been met. This is unrealistic.

The specification of a set of months for measuring foliage coverage does not recognize the great differences in foliage across plants and climate zones. Not all plants show their foliage in the warmest months. For instance, the Mediterranean climate can be extremely dry "in the warm months" when plants will enter their dormant period, when plant coverage will tend to decrease. Plant coverage in Mediterranean and hot, dry climates is likely to increase during the region's colder season. Moreover, foliage among groups of plants may come at staggered intervals, with some plants gaining and losing their leaves much earlier than do others.

The requirement for 80% foliage coverage may be too high for hot, dry climates and for vegetative roofs where the builder's goals for the roof go beyond heat island mitigation.

In hot and dry areas of Climate Zones 1-3 (especially 1b, 2b, and 3b), the lack of moisture is unlikely to support 80% foliage coverage without regular irrigation and maintenance, which is at odds with the code's water efficiency goals.

A builder may want to use plants that are of particular value to local birds and pollinating insects. Some such plants, however, may not offer the same level of foliage provided by sedums and other plants more typical to vegetative roofs. Their root systems may be extensive and still absorb stormwater, however. The 80% foliage requirement minimizes the level of flexibility that a builder would have in achieving alternative goals, however beneficial they may be.

The revisions suggested here are intended to address these gaps. They draw from IgCC Section 408.2.3, Shading by trees, which is written in such a way as to provide the building official the required information up-front, but does not require that the building official revisit the site in later years to ensure that the required coverage has been met.

Cost Impact: Will not increase the cost of construction. This proposal adds flexibility to the text of IgCC and could potentially lower the costs of compliance.

GG170-14: 408.3.2 #1-GITLIN814

GG171-14

408.3.2

Proponent: Thomas Slabe, USEPA, representing USEPA and Jennifer Boussetot, Colorado State University

Revise as follows:

408.3.2 Vegetative roofs. Vegetative roofs, where provided in accordance with Section 408.3, shall comply with the following:

1. All plantings shall be selected based on their hardiness zone classifications in accordance with USDA MP1475 and shall be capable of withstanding the climate conditions of the jurisdiction and the micro climate conditions of the building site including, but not limited to, wind, precipitation and temperature. Planting density shall provide foliage coverage, in the warm months, of not less than 80 percent within two years of the date of installation unless a different time period is established in the *approved* design. Plants shall be distributed to meet the coverage requirements. *Invasive plant species* shall not be planted.
2. The ~~engineered~~ soil medium shall be designed for the physical conditions and local climate to support the plants and shall consist of nonsynthetic materials. The planting design shall include measures to protect the engineered soil medium until the plants are established. Protection measures include, but are not limited to, installation of pregrown vegetated mats or modules, tackifying agents, fiber blankets and reinforcing mesh. The maximum wet weight and water holding capacity of ~~an engineered~~ a soil medium shall be determined in accordance with ASTM E 2399.
3. Where access to the building facades is provided from locations on the perimeter of the roof, nonvegetated buffers adequate to support associated equipment and to protect the roof shall be provided.
4. Nonvegetated clearances as required for fire classification of vegetative roof systems shall be provided in accordance with the *International Fire Code*.
5. Plantings shall be capable of being managed to maintain the function of the vegetative roof as provided in the documents required by Section 904.3.

Reason: As currently written, the code requires the use of engineered soils to meet the requirements of Section 408.3.2. The purpose of this proposal is to allow for the use of non-engineered soils. The proposal merely removes the word “engineered,” thus adding flexibility to the code, but still maintaining the requirements that the soil medium be appropriate for the site and be protected.

The use of non-engineered soil medium is advocated in design guidance in Basel, Switzerland, where “design criteria includes varying the substrate thickness and using natural soils from nearby areas” (Brenneisen, 2006). In the United Kingdom, studies have been conducted to characterize “alternative recycled waste materials” used in green roof applications. Such alternative soil medium materials can help improve biodiversity and enhance specific ecosystem services in urban settings (Molineux et al., 2009). Ecosystem services are a critical category of benefits of green roofs. One important ecosystem service of a green roof is cooling, due to evapotranspiration of stormwater and perhaps irrigation when applied. However, this benefit of cooling the local environment should be realized in combination with other important ecosystem services that green roofs afford (Oberndorfer et al., 2007). It should be understood that substrates used on green roofs can vary according to the design intention of the roof. The substrate chosen is based upon the intention of the green roofs design. The cooling benefit that green roofs provide is only partially based upon the type of soil medium selected for the roof. Other benefits that relate to the biological community depend upon the choice of soil medium, as has been shown in work on threatened and endangered bird species (Baumann, 2006; Fernandez-Canero and Conzalez-Redondo, 2010). Selecting a non-engineered soil medium based upon other design intentions of the green roof does not mean the cooling properties of the green roof are compromised and should not exclude any entity from obtaining credit for the design because a secondary design intention for a given application calls for a soil medium that is not considered ‘engineered’ soil medium.

Where load bearing capacity of a roof is adequate, it is possible, and may be preferable, to use native/natural soils rather than engineered substrates, or a blend of natural soils and engineered soil. The production of engineered substrates releases considerable carbon dioxide and engineered substrates must be transported from production facilities to the building site over indefinite distance. By contrast, native soils are acquired locally, thus avoiding the environmental impacts of manufacturing and transportation, and they also contain the microflora and microfauna community structure that is indigenous to the region. Native soil blended with an engineered soil medium will likely increase numbers of mycorrhizae fungi and nitrifying microorganisms, which can improve plant growth and resilience. Green roof installers, e.g., Green Roofs of Colorado, “topcoat” the green roof with soil from the site or even may blend local soils with engineered substrate.

Green roof technology is diversifying in step with the increase of design intentions, as the technology matures and as more environmentally friendly materials and methods are incorporated into the technology. For instance, the addition of biochar in green roof soil media reportedly improves the water quality of roof stormwater runoff, indefinitely stores greater amounts of carbon on the roof, and retains greater amounts of water and nutrients in the soil medium. Knowledge of green roof soil media is significant, yet knowledge of and information on the topic is steadily increasing at a significant rate. Therefore it is recommended that restrictive language be removed from this section as pertains to soil medium, according to the recommendation presented.

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Cost Impact: Will not increase the cost of construction. This proposal adds flexibility to the text of IgCC and could potentially lower the costs of compliance.

GG171-14: 408.3.2 #2-GITLIN815

GG172-14

408.3.2

Proponent: Jason Wilen, representing National Roofing Contractors Association (NRCA)
(jwilen@nrca.net)

Revise as follows:

408.3.2 Vegetative roofs. Vegetative roofs, where provided in accordance with Section 408.3, shall comply with the following:

1. All plantings shall be selected based on their hardiness zone classifications in accordance with USDA MP1475 and shall be capable of withstanding the climate conditions of the jurisdiction and the micro climate conditions of the building site including, but not limited to, wind, precipitation and temperature. Planting density shall provide foliage coverage, in the warm months, of not less than 80 percent within two years of the date of installation unless a different time period is established in the *approved* design. Plants shall be distributed to meet the coverage requirements. *Invasive plant species* shall not be planted.
2. The engineered soil medium shall be designed for the physical conditions and local climate to support the plants and shall consist of nonsynthetic materials. The planting design shall include measures to protect the engineered soil medium until the plants are established. Protection measures include, but are not limited to, installation of pregrown vegetated mats or modules, tackifying agents, fiber blankets and reinforcing mesh. The maximum wet weight and water holding capacity of an engineered soil medium shall be determined in accordance with ASTM E 2399.
3. Where access to the building facades is provided from locations on the perimeter of the roof, nonvegetated buffers adequate to support associated equipment and to protect the roof shall be provided.
4. Nonvegetated clearances as required for fire classification of vegetative roof systems shall be provided in accordance with the *International Fire Code*.
5. Plantings shall be capable of being managed to maintain the function of the vegetative roof as provided in the documents required by Section 904.3.
6. Installation of plantings shall be in accordance with the roof covering manufacturer's installation instructions and shall not diminish the weather protective properties of the roof covering.

Reason: This code change proposal is intended to clarify the code's intent by specifically requiring that the procedure used to install the vegetative portion of the roof assembly not compromise the roof covering's ability to serve as a weather barrier. The term "weather protective properties" is used because the roofing chapters of both the IBC and IRC use the term "weather protection" (IBC Section 1503—Weather Protection and IRC Section R903—Weather Protection).

Secondly, the referencing of roof covering manufacturer's installation instructions is important because it has become commonplace for roof covering manufacturers to offer products that are specifically intended to be used as part of a vegetative roof system, or to offer an entire vegetative roof system including the planting and roofing material. These products and systems typically have installation instructions that should be followed to ensure the proper functioning of the components.

Cost Impact: Will not increase the cost of construction.

GG172-14: 408.3.2-WILEN783

GG173-14

408.3.2.1 (New), 408.3.2.2 (New), Chapter 12

Proponent: Wanda Edwards, RCI, Inc., representing RCI, Inc. (wedwards@rci-online.org)

Add new text as follows:

408.3.2.1 Membrane testing. After installation, membranes shall be tested to locate deficiencies in the roof system to ensure a leak-free roof. Tests shall be performed using one of the methods specified in Section 408.3.2.2. Breaches shall be corrected prior to covering the membrane with growing media, trays or containers used to contain growing media, large stone, paver systems or lightweight interlocking pavers. The roof shall be repaired and retested as required until no breaches remain.

408.3.2.2 Test methods. Testing as required in Section 408.3.2.1 shall comply with one of the following methods. The test shall cover all areas of the roof. The test report shall indicate all anomalies found by the testing, the corrective action methods and the results. Copies of the survey and associated documents shall be given to the building owner and made available to the code official upon request. Continuous visual inspection in accordance with ASTM 7186 shall be performed on EPDM, foil-faced and other conductive membranes where insulation is present under the membrane instead of such testing.

1. Standing water flood test shall be performed in accordance with ASTM D5957. The test shall be conducted by continuously applying water over the membrane for a minimum of 24 hours. This test shall not be performed on assemblies where there is insulation under the roof membrane. The structural load capacity of the roof deck shall be verified by a registered design professional prior to flood testing.
2. An electronic leak detection survey such as, but not limited to, low or high voltage electronic integrity testing of roof areas performed in accordance with ASTM D 7877. This test shall not be performed on EPDM, foil-faced roofs or other membranes that conduct electricity.

Add new standard(s) as follows:

ASTM

ASTM D 5957-98(2013) Standard Guide for Flood Testing Horizontal Waterproofing Installations

ASTM D 7186-12 Standard Practice for Quality Assurance Observation of Roof Construction and Repair

ASTM D 7877-14 Electronic Methods for Detecting and Locating Leaks in Waterproof Membranes

Reason: New and existing roof membranes should be tested for leaks prior to installing the vegetative roof. Leaks in the roof membrane threaten the safety of the building occupants through moisture damage, growth of harmful mold and rot and can result in costly repairs. Testing and repair of the roofing system is necessary to eliminate moisture damage within the building, and assure good air quality within the building in addition to eliminating the expense of repairs requiring removal of the vegetative roof overburden.

Cost Impact: Will increase the cost of construction. The code change proposal will increase the cost of construction. However, this testing is a necessary part of the construction that will eliminate costly roof leaks or premature roof failures after the plantings are added.

Analysis: A review of the standard proposed for inclusion in the code, ASTM D 5957-98(2013), D7186-12, ASTM D 7077-14 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG173-14: 408.3.2.1 (NEW)-EDWARDS1075

GG174-14

409.1

Proponent: Jennifer Hatfield, J. Hatfield & Associates, PL, representing Association of Pool & Spa Professionals (jhatfield@apsp.org)

Revise as follows:

409.1 Light pollution control. Where this section is indicated to be applicable in Table 302.1, uplight, light trespass, and glare shall be limited for all exterior lighting equipment as described in Sections 409.2 and 409.3.

Exception: Lighting used for the following exterior applications is exempt where equipped with a control device independent of the control of the nonexempt lighting:

1. Specialized signal, directional, and marker lighting associated with transportation.
2. Advertising signage or directional signage.
3. Lighting integral to equipment or instrumentation and installed by its manufacturer.
4. Theatrical purposes, including performance, stage, film production, and video production.
5. Athletic playing areas where lighting is equipped with hoods or louvers for glare control.
6. Temporary lighting.
7. Lighting for industrial production, material handling, transportation sites, and associated storage areas where lighting is equipped with hoods or louvers for glare control.
8. Theme elements in theme and amusement parks.
9. Roadway lighting required by governmental authorities.
10. Lighting used to highlight features of public monuments and registered landmark structures.
11. Lighting classified for and used in hazardous areas.
12. Lighting for swimming pools, spas, and water features.

Reason: Spas appear to have been left out of this exception, which includes swimming pools and water features. The change clarifies that spas also fall under the exception.

Cost Impact: Will not increase the cost of construction.

GG174-14: 409.1-HATFIELD1064

GG175-14

409.1

Proponent: Glenn Heinmiller (glenn@lampartners.com)

Revise as follows:

409.1 Light pollution control. Where this section is indicated to be applicable in Table 302.1, uplight, light trespass, and glare shall be limited for all exterior lighting equipment as described in Sections 409.2 and 409.3.

Exception: Lighting used for the following exterior applications is exempt where equipped with a control device independent of the control of the nonexempt lighting:

1. Specialized signal, directional, and marker lighting associated with transportation.
2. Advertising signage or directional signage.
3. Lighting integral to equipment or instrumentation and installed by its manufacturer.
4. Theatrical purposes, including performance, stage, film production, and video production.
5. Athletic playing areas where lighting is equipped with hoods or louvers for glare control.
6. Temporary lighting.
7. Lighting for industrial production, material handling, transportation sites, and associated storage areas where lighting is equipped with hoods or louvers for glare control.
8. Theme elements in theme and amusement parks.
9. Roadway lighting required by governmental authorities.
10. Lighting used to highlight features of public monuments and registered landmark structures.
11. Lighting classified for and used in hazardous areas.
12. Lighting for swimming pools and water features.
13. Lighting for the national flag in exterior lighting zones 2, 3, and 4.

Reason: This exemption for the lighting of only the National flag in only Lighting Zones 2, 3 and 4, is consistent with the Light Pollution Reduction credit in LEED Version 4. Without this exemption, lighting of the National flag would effectively be prohibited by the code in most cases.

Cost Impact: Will not increase the cost of construction.

GG175-14: 409.1-HEINMILLER367

GG176-14

409.1.1, Table 409.1.1

Proponent: Glenn Heinmiller (glenn@lampartners.com)

Revise as follows:

409.1.1 Exterior lighting zones. The lighting zone for the building site shall be determined from Table 409.1.1 unless otherwise specified by the jurisdiction.

**TABLE 409.1.1
EXTERIOR LIGHTING ZONES**

LIGHTING ZONE	DESCRIPTION
1	<p>Developed areas of national parks, state parks, forest land and rural areas <u>Rural and low-density residential areas such as, but not limited to: agricultural districts, one- and two-family residential communities, business parks, rural town centers, commercial or industrial areas with limited nighttime activity and the developed areas within parks and open space preserves.</u></p>
2	<p>Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed-use areas <u>Light commercial business districts and high-density or mixed-use residential districts such as, but not limited to: neighborhood business districts, light industrial areas with moderate nighttime activity, multifamily residential uses, institutional residential uses, hospitals, hotels, motels, churches, schools and neighborhood recreation facilities.</u></p>
3	<p>All other areas <u>High-density commercial business districts, and heavy industrial or manufacturing areas such as, but not limited to: business districts in large cities, commercial corridors, high-density suburban commercial areas, town center mixed-use areas, industrial uses and shipping and rail yards with high nighttime activity, high-use recreation facilities, regional shopping malls, car dealerships, gas stations, and other exterior retail areas with high nighttime activity.</u></p>
4	<p>High activity commercial districts in major metropolitan areas as designated by the local jurisdiction <u>Areas such as, but not limited to, high-density entertainment districts and heavy industrial areas, where <i>approved by the code official</i></u></p>

Reason: This proposal changes the definitions of the Exterior Lighting Zones to be consistent with the correct standard. The current definitions are from the energy codes IECC and Standard 90.1. The definitions should be based on those in the IES/IDA Model Lighting Ordinance (MLO), which is the light pollution control standard that Section 409 and LEED v4 SSc6 are based upon. The definitions in this proposal are derived from those in the MLO User's Guide. They have been edited for clarity and to be more appropriate code language, but the intent is maintained.

Cost Impact: Will not increase the cost of construction.

GG176-14: TABLE 409.1.1-HEINMILLER368

GG177-14

409

Proponent: Craig Conner, representing self (craig.conner@mac.com)

Delete without substitution:

~~SECTION 409~~

~~SITE LIGHTING~~

Reason: The site lighting section is not needed.

Cost Impact: Will not increase the cost of construction.

GG177-14: 409-CONNER1225

GG178-14
410 (New), 410.1 (New)

Proponent: Eric Haugh(haugh@pyramidmep.com)

Add new text as follows:

SECTION 410
DRINKING FOUNTAINS

410.1 Drinking fountains. Drinking fountains serving gymnasium areas shall be equipped with a water bottle filler. Not less than one water bottle filler shall be provided for each gymnasium.

Reason: To eliminate water being spilled on floors when students try to fill their water bottle from the bubbler.

Cost Impact: Will increase the cost of construction. Increase will be minimal compared to the overall cost of a school.

GG178-14:410 (NEW)-HAUGH761

GG 179-14

502.1, 502.1.1, 502.1.2, 503, 503.1, 504, 504.1, 504.2, 502, 502 (New) (New), 502.1 (New) (New), 502.1.1 (New) (New), 502.1.2 (New) (New), 502.2 (New) (New), 502.3 (New) (New)

Proponent: Craig Conner, representing self (craig.conner@mac.com); Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Delete and substitute as follows:

SECTION 502 CONSTRUCTION MATERIAL MANAGEMENT

~~502.1 Construction material management. Construction material management shall comply with Sections 502.1.1 and 502.1.2.~~

~~502.1.1 Storage and handling of materials. Materials stored and handled onsite during construction phases shall comply with the applicable manufacturer's printed instructions. Where manufacturer's printed instructions are not available, approved standards or guidelines shall be followed.~~

~~502.1.2 Construction phase moisture control. Porous or fibrous materials and other materials subject to moisture damage shall be protected from moisture during the construction phase. Material damaged by moisture or that are visibly colonized by fungi either prior to delivery or during the construction phase shall be cleaned and dried or, where damage cannot be corrected by such means, shall be removed and replaced.~~

SECTION 503 CONSTRUCTION WASTE MANAGEMENT

~~503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:~~

- ~~1. The location for collection, separation and storage of recyclable construction waste shall be indicated.~~
- ~~2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.~~
- ~~3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.~~
- ~~4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the code official, evidence of diversion shall be provided.~~

~~For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.~~

SECTION 504 WASTE MANAGEMENT AND RECYCLING

~~504.1 Recycling areas for waste generated post certificate of occupancy.~~

~~Waste recycling areas for use by building occupants shall be provided in accordance with one of the following:~~

- ~~1. Waste recycling areas shall be designed and constructed in accordance with the jurisdiction's laws or regulations;~~
- ~~2. Where laws or regulations do not exist or where limited recycling services are available, waste recycling areas shall be designed and constructed to accommodate recyclable materials based on the availability of recycling services; or~~
- ~~3. Where recycling services are not available, waste recycling areas shall be designed and constructed to accommodate the future recycling of materials in accordance with an approved design. The approved design shall meet one of the following:~~
 - ~~3.1 The approved waste recycling area design shall be based on analysis of other regional recycling services, laws or regulations.~~
 - ~~3.2 The approved waste recycling area shall be designed to meet the needs of the occupancy, facilitate efficient pick-up, and shall be available to occupants and haulers.~~

~~**504.2 Storage of lamps, batteries and electronics.** Storage space shall be provided for fluorescent lamps, high intensity discharge (HID) lamps, batteries, electronics, and other discarded items requiring special disposal by the jurisdiction.~~

SECTION 502 **CONSTRUCTION WASTE MANAGEMENT**

502.1 Waste amount. Construction waste shall meet one of the following criteria for non-hazardous waste:

1. Construction waste sent to disposal shall not exceed 3 lb/ft² of gross floor area. The materials sent to disposal shall be documented.
2. Not less than fifty percent of the waste shall be diverted from disposal by reuse, recycle, salvage or sale. The fifty percent shall be determined by weight or volume, but not both. Both the materials diverted from disposal and the materials sent to disposal shall be documented.

502.1.1 Waste management plan. A plan for reuse, recycle, salvage, donation or sale by type of materials shall be included with construction documents. The approved plan shall include the intended disposition of construction waste materials. Both sorting on site and storage of waste materials for sorting at another location shall be permitted.

502.1.2 Waste not covered. For the purpose of this section, construction and waste materials shall not include land clearing debris, excavated soils and fill and base materials such as, but not limited to, *topsoil*, sand and gravel. This section shall also exclude trees, stumps, rocks and vegetation.

502.2 Waste storage. Storage of construction waste shall be in compliance with the combustible waste material requirements of Section 304 of the *International Fire Code*.

502.3 Hazardous waste. Hazardous waste shall be handled in accordance with laws, rules and ordinances that are applicable in the jurisdiction.

Reason: The text on construction waste is simplified and made more practical by this proposed change. The overlapping topics of the existing sections 502, 503 and 504 are merged.

In order:

New 502.1 item #1 adds a practical option based on limiting the total waste. Since limiting waste is the goal, this allows buildings with low levels of waste to comply directly. The value proposed, 3lb/ft², is below the average for commercial building waste, but achieved by many existing buildings. Attention to waste

reduction during design can lead to low levels of waste. Achieving low levels of waste can be better than diverting 50% of a high level of waste; for example 3 lb/ft² is less waste than 50% of 8 lb/ft². EPA says the average waste is over 4 lb/ft², ranging from 1.6 to 8.6 lb/ft². (See <http://www.epa.gov/epawaste/conservation/imr/cdm/pubs/cd-meas.pdf>, page 10)

New 502.1 items #2 simplifies the text, but diverting 50% is the same option as is already in the IgCC.

New 502.1.1 simplifies the required waste management plan. It also clarifies that sorting waste offsite is allowed. Offsite sorting is often the least cost method of diverting waste.

New 502.1.2 lists the wastes not covered by this section, as in existing 503.1. Chapter 4 covers site waste.

New 502.2 adds a new pointer to the combustible waste provisions of the IFC. It also deletes post occupancy recycling storage requirements (existing 504.1), which has very little enforceable content and is confusing. Would a cabinet labeled "put recyclables here" meet the existing 504.1?

New 502.3 replaces a specification for a storage space for some specific items requiring special disposal, the existing 504.2, with a requirement to handle (all) hazardous wastes based on existing regulations.

Cost Impact: Will not increase the cost of construction

GG 179-14 : 502 (NEW)-CONNER1221

GG180-14

502.1.1

Proponent: Michael Gardner, Gypsum Association, representing Gypsum Association
(mgardner@gypsum.org)

Revise as follows:

502.1.1 Storage and handling of materials. ~~Materials stored and handled onsite~~ The onsite storage and handling of materials during construction phases shall comply with the applicable manufacturer's printed or electronic media instructions. Where manufacturer's ~~printed~~ instructions are not available, approved printed or electronic media standards or guidelines shall be followed.

Reason: While tangible documentation is essential to the code process, limiting the format of documents that might be used to substantiate an action only to print-format material seems archaic.

Permitting the use of electronic media that is produced by a manufacturer or standards setting organization to serve as documentation for material storage issues will not weaken the intent of the language in Section 502.1.1 or harm the overall enforcement of the code. Electronic documents are produced with reference and edition dates and are easily archived.

The IgCC currently endorses the concept of electronic media documentation via a reference to the International Building Code. Section 104 of the IgCC requires construction documents to comply with the IBC. Section 107 of the IBC permits construction submittal documents to be transmitted in electronic media format.

Also, the first sentence has been re-cast to make it clear that Section 502.1.1 addresses the storage of materials and not the materials themselves. At present, the sentence is somewhat unclear.

Cost Impact: Will not increase the cost of construction.

GG180-14 : 502.1.1-GARDNER461

GG181-14

503.1

Proponent: Paul Coats, American Wood Council, representing American Wood Council
(pcoats@awc.org)

Revise as follows:

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, salvage for future use, donation or sale; recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale ~~clean or resinated biomass-to-energy conversion~~ shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: Burning waste wood products for energy production is increasing, and construction waste of clean lumber or engineered wood products (typically resinated with glue) should be specified with other diverted materials. The addition of clean or resinated biomass used for energy conversion is the only change. "Salvage for future use, donation, or sale" was simply moved up in the order from the existing text so it reads better, and other minor editorial improvements were made for grammatical reasons.

Cost Impact: Will not increase the cost of construction.

GG181-14 : 503.1-COATS752

GG182-14

503.1

Proponent: David Collins, The Preview Group, representing The American Institute of Architects (dcollins@preview-group.com)

Revise as follows:

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

The percentage of materials diverted shall be calculated by weight or volume, but not both. For the purposes of this section, construction materials and waste shall include, but are not limited to (1)all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging; and (2) includes construction materials and waste removed during demolition or razing. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: Updated the language to specify that construction materials and also waste material and waste removed during demolition or razing and not just materials moved to the site

Cost Impact: Will not increase the cost of construction.

GG182-14 : 503.1-COLLINS387

GG183-14

503.1

Proponent: Barry Greive, Target Corporation, representing Target Corporation
(barry.greive@target.com)

Revise as follows:

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1 or in regions where the infrastructure does not exist and approved as part of the Construction Material and Waste Management Plan. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: There are many areas where the infrastructure is not yet available to recycle 50 percent of construction materials. Target has an extensive material diversion program is a leader in recycling; and in many areas of the country it is possible to only recycle 10 % of materials. Many regions do not have the resources to recycle enough construction materials to hit the 50% threshold and it is also dependent on the type of project taking place. Some jurisdictions are too far away from a recycling center to make it viable to meet this requirement. Trucking material 100 plus miles goes against the principals of what this code was founded on. The Code officials know what services are available in their community and this will be a good addition to the code in those areas where the infrastructure is not available at this time.

Cost Impact: Will not increase the cost of construction.

GG183-14 : 503.1-GREIVE1101

GG184-14

202 (New), 503.1

Proponent: Mark Nowak, representing Steel Framing Alliance

Add new definition as follows:

SECTION 202 DEFINITIONS

Manufactured to size. A structural member that does not produce waste at the construction site or excess material at the point of manufacturing by being manufactured to the size specified for installation.

Revise as follows:

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. Where structural materials are manufactured to a specified size, credit equivalent to 5 percent of the total material manufactured to size shall apply toward the total amount of waste diverted. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, manufactured to size, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: Materials used to frame a building constitute over 20% of construction waste for non-residential and average over 42% for residential buildings, according to data compiled in a study by Franklin Associates for the U.S. Environmental Protection Agency¹. This is a significant amount of material that goes into landfills. By recognizing framing materials that are manufactured to eliminate waste onsite and during manufacturing, the IgCC will facilitate reduction of waste ending up in landfills.

Manufacturing framing products to specified size reduces the amount of waste that is generated from the start. Five to 15% of framing materials is waste^{2, 3}. This proposal encourages more-efficient framing methods by crediting the waste that is prevented as being effectively diverted from a landfill.

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2. "How to estimate the cost of load-bearing wood framed walls," Shane Nocus, in Estimating Today, April 2009, American Society of Professional Estimators, Nashville, TN

3. "Whittling down wood waste," Peter Yost, et. al., in May-June 2006 Home Energy magazine, Berkeley, CA.

Cost Impact: Will not increase the cost of construction.

GG184-14 : 503.1-NOWAK338

GG185-14

503.1

Proponent: Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov)

Revise as follows:

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. A Construction Material and Waste Management Plan shall be submitted with the construction documents developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of salvageable and recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by ~~weight or volume, but not both.~~ one of the following methods:
 - 3.1. Weight
 - 3.2. Volume
 - 3.3. Unit
4. Receipts or other documentation related to ~~diversion~~ the reuse, recycling and disposal of material shall be maintained through the course of construction. Where requested by the code official, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: This proposal provides clarification related to the waste diversion plan and continues to reinforce the concept of salvage when diverting materials from the landfill. As currently written, the waste diversion plan shall be developed and implemented, but without submitting the document, there is no way for the jurisdiction to know if required diversion targets have been met. The waste diversion plan is a powerful tool that helps the owner to think ahead of where materials leaving the site might end up; therefore this proposal identifies that it is appropriate to have the plan submitted prior to beginning construction. Salvage is more sustainable than recycling so this proposal continues to reinforce that. "Unit" is another metric of measurement when materials transfer owners, so it has been added to the list with weight and volume.

Cost Impact: Will not increase the cost of construction.

GG185-14 : 503.1-PETRIE1192

GG186-14

406.1, 406.2, 503.1

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Sustainability, Energy & High Performance Building Code Action Committee

Revise as follows:

406.1 Building site waste management plan. A building site waste management plan shall be developed and implemented to divert not less than 75 percent of the land-clearing debris and excavated soils from disposal. Land-clearing debris includes rock, trees, stumps and associated vegetation. The plan shall include provisions that address all of the following:

1. Materials to be diverted from disposal by efficient usage, recycling or reuse on the building site shall be specified.
2. Diverted materials shall not be sent to sites that are agricultural land, *flood hazard areas* or *greenfield* sites where development is prohibited by Section 402.1 except where *approved* by the *code official*.
3. The effective destruction and disposal of *invasive plant species*.
4. Where contaminated soils are removed, the methods of removal and location where the soils are to be treated and disposed.
5. The amount of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
6. Where the site is located in a federal or state designated quarantine zone for invasive insect species, building site vegetation management shall comply with the quarantine rules.
7. Receipts or other documentation related to diversion shall be maintained through the course of construction. When requested by the *code official*, evidence of diversion shall be provided.

406.2 Construction waste. Construction materials and waste and hardscape materials removed during site preparation shall be managed in accordance with Section 503.

Revise as follows:

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. A Construction Material and Waste management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. For the purposes of this section, construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: This proposal clarifies:

- a) Exactly where the land-clearing debris and excavated soils referenced in Section 406.1 are to be diverted from, which is from disposal, and
- b) That where Section 503.1 indicates “construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel,” that language is intended to apply to Section 504.1 and is not intended to imply that those materials should not be regulated under Section 406.1.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG186-14 : 503.1 #1-THOMPSON351

GG187-14

503.1

Proponent: Brenda Thompson, representing Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste where such salvage and recycling facilities are available within 75 miles of the building site. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

There are rural or remote locations where the cost or impact to the environment for transporting is greater than the benefit. That should not be a barrier to creating a green facility.

Diesel exhaust is a well-known human carcinogen estimated to be responsible for 70 percent of the total cancer risk from air pollution. Notably, the occupational exposure of truck drivers, railroad workers, heavy-equipment operators, and other workers is associated with lung cancer risks 40 percent higher, on average, than in the population at large. In fact, a recent study of the U.S. trucking industry found an excess risk of death due to lung cancer and ischemic heart disease particularly among drivers. Numerous studies have documented a wide range of other adverse health impacts from long-term exposure to fine particulate matter, a major component of diesel exhaust. These include increased risk for cardiovascular disease such as atherosclerosis, increased heart attacks, increased emergency room visits for acute health events, birth defects, low birth weights, premature births, and increased rates of death.¹ A recent California Air Resources Board (CARB) report quantified some of the health impacts caused by diesel exhaust from freight transport in California; it found 2,400 premature deaths, 2,830 hospital admissions, 360,000 missed workdays, and 1,100,000 missed days of school in 2005.²

Burning a gallon of diesel fuel produces 22.38 pounds of CO₂.³ On average Semi-trucks get 6.5 miles per gallon.⁴ A 50 mile trip would require approximately 65 gallons to complete each trip thus producing approximately 1,455 pounds of CO₂. On a new elementary school construction project a total of 115 hauls were required to dispose/divert approximately 450 tons of debris. Having to transport this construction waste to a recycling center over 50 miles from the site would have produced approximately 167,000 pounds of CO₂. Requiring extended distances to recycle construction debris will inversely impact the environment.

Bibliography:

1. Driving on Fumes, Truck Drivers Face Elevated Health Risks from Diesel Pollution, Diane Bailey, and Natural Resources

Defense Council, Zach Goldman, Coalition for Clean and Safe Ports, Maria Minjares, Natural Resources Defense Council; NRDC Issue Paper, December 2007; accessed 21 November 2013 at: <http://www.nrdc.org/health/effects/driving/driving.pdf>

2. California Air Resources Board. "Quantification of the Health Impacts and Economic Valuation of Air Pollution From Ports and Goods Movement in California." Appendix A in Emission Reduction Plan for Ports and Goods Movement (GMERP), March 22, 2006 accessed at: www.arb.ca.gov/planning/gmerp/march21plan/appendix_a.pdf
3. US Department of Energy, The U.S. Energy Information Administration (EIA), Frequently Asked Questions, accessed 22 November 2013 at: <http://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11>
4. The National Academies, Technologies and Approaches to Reducing the Fuel Consumption of Medium and Heavy-Duty Vehicles, 2010 accessed 22 November 2013 at: http://cta.ornl.gov/vtmarketreport/pdf/chapter3_heavy_trucks.pdf

Cost Impact: Will not increase the cost of construction. The change should decrease the cost of construction depending on the location.

GG187-14 : 503.1 #2-THOMPSON1040

GG188-14

503.1

Proponent: Martha VanGeem, representing self (martha.vangeem@gmail.com)

Revise as follows:

503.1 Construction material and waste management plan. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, except where other percentages are indicated in Table 302.1. The total amount of construction waste generated shall not exceed 2.5 lbs per ft² for new building projects on sites with less than 5 percent existing buildings, structures, or landscape. A Construction Material and Waste Management Plan shall be developed and implemented to recycle or salvage construction materials and waste. The Construction Material and Waste Management Plan shall comply with all of the following:

1. The location for collection, separation and storage of recyclable construction waste shall be indicated.
2. Materials to be diverted from disposal by efficient usage, recycling, reuse, manufacturer's reclamation, or salvage for future use, donation or sale shall be specified.
3. The percentage of materials to be diverted shall be specified and shall be calculated by weight or volume, but not both.
4. The total weight of construction waste generated shall be calculated per square foot of new building projects on sites with less than 5 percent existing buildings, structures, or landscape.
5. Receipts or other documentation related to diversion shall be maintained through the course of construction. Where requested by the *code official*, evidence of diversion shall be provided.

For the purposes of this section, construction materials and waste shall include all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging. Construction and waste materials shall not include land-clearing debris, excavated soils and fill and base materials such as, but not limited to, topsoil, sand and gravel. Land-clearing debris shall include trees, stumps, rocks, and vegetation. Excavated soil, fill material and land-clearing debris shall be managed in accordance with Section 406.1.

Reason: While it is admirable to divert waste from a landfill, it is better to not generate waste on the construction site. This language is similar to that in LEED v4. It allows for twice as much waste generated as allowed in *ASHRAE/USGBC/IES Standard 189.1 on High Performance Green Buildings*.

The amount of waste allowed is based on the average amount of waste generated at a new construction site. This will require more planning prior to construction but could result in cost savings due to more efficient design, fabrication and construction.

Cost Impact: Will increase the cost of construction.

GG188-14 : 503.1-VANGEEM1013

GG189-14

Table 302.1, 503.2 (New)

Proponent: Tien Peng, National Ready Mixed Concrete Association, representing National Ready Mixed Concrete Association (tpeng@nrmca.org); Martha VanGeem, Consulting Engineer, representing self; Jason Krohn, Precast/Prestressed Concrete Institute, representing Precast/Prestressed Concrete Institute (jkrohn@pci.org); Stephen Szoke, Portland Cement Association, representing Portland Cement Association (sszoke@cement.org)

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY			
503.1	Minimum percentage of waste material diverted from landfills	<input type="checkbox"/> 50% <input type="checkbox"/> 60% <input type="checkbox"/> 75%	
503.2	Resilient design and construction	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

Add new text as follows:

503.2 Resilient Design and Construction. Where this section is indicated to be applicable in Table 302.1, the project building shall be designed to resist hazards above the minimum requirements in the International Building Code including fire, snow, wind, floods, earthquake, hail and other natural or man-made hazards to reduce the environmental impacts associated with extracting, processing, transporting and installing materials for repairing, replacing or retrofitting a building after a disaster. The requirements of this section shall be performed in accordance with the following:

1. Reduced environmental impacts from disaster resilient design for natural and man-made hazards shall be demonstrated through whole-building life cycle assessment of the project building. To meet this requirement, two buildings shall be designed; a reference building and project building, and life cycle assessment shall be performed on each building. The reference building shall be designed to the minimum requirements of this code and the minimum loads and hazards of the International Building Code and the project building shall be designed to a higher level of loads and hazards. Taking into account the probability of the buildings being subjected to project building loads and hazards over a 75-year life of the buildings, damage to the buildings and the

- environmental impact of repairing, replacing and retrofitting the buildings shall be estimated and these impacts shall be included in the life cycle assessment.
2. The life cycle assessment shall conform to the requirements of ISO 14044.
 3. The life cycle assessment shall demonstrate that the building project achieves not less than a 5-percent improvement in environmental performance for global warming potential and at least 4 of the following impact measures, as compared to a reference design of similar usable floor area, function, materials and configuration that meets the minimum requirements of this code and the requirements of the International Building Code.
 - 3.1. Acidification potential.
 - 3.2. Eutrophication potential.
 - 3.3. Ozone depletion potential.
 - 3.4. Smog potential.
 - 3.5. Depletion of non-renewable energy resources.
 - 3.6. Depletion of non-renewable material resources.
 - 3.7. Use of renewable material resource.
 - 3.8. Use of renewable primary energy.
 - 3.9. Consumption of freshwater.
 - 3.10. Hazardous waste.
 - 3.11. Non-hazardous waste.
 - 3.12. Impact(s) and potential impact(s) on biodiversity.
 - 3.13. Toxicity related to human health, the environment or both.
 4. The reference and project buildings shall utilize the same life cycle assessment tool.
 5. The life cycle assessment tool shall be approved by the code official.
 6. Building operational energy shall be included.
 7. Building process loads shall be permitted to be included.
 8. Maintenance and replacement schedules and actions for components shall be included in the assessment.
 9. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.
 10. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.

Reason: The consequences of natural disasters have become increasingly real, personal and devastating. In 2012, there were 11 natural disasters costing \$1 billion or more in damage, making 2012 the second highest year with billion-dollar disasters [i]. Now, with the world's attention on the Philippines after Typhoon Haiyan, communities must rethink the way we build to meet the challenge of natural or man-made disasters. Globally, insurers lost at least \$108 billion on disasters in 2011 and \$77 billion in 2012 [iii]. Reinsurer Swiss Re Ltd. said that 2011 was the second-worst year in the insurance industry's history. Only 2005, with Hurricane Katrina and other major storms, were more costly [iii]. However, most of the increased disaster losses cannot be attributed to an increased occurrence of hazards. Frequency of major US hurricane landfalls has remained constant in the last 60 years [iv], and the trend of strong to violent tornadoes (F3+) has, in fact, decreased since 1954 [v].

Buildings, when designed to minimum code requirements, are intended to experience controlled damage and provide minimum life safety. Therefore even if the building must be demolished or significantly repaired after a major earthquake, hurricane, tornado, fire or flood, it has met the intent of the code. For projects in high-risk areas, this minimal level of performance results in significant additional material impacts following a major natural or man-made event.

As a society, we have placed a great deal of emphasis on recycling rates and carbon footprints. It is ironic that we are surprisingly willing to invest considerable amounts of upfront capital for a building that achieves a modest savings in energy efficiency, yet we are completely satisfied if the structure meets only the code minimum requirements for seismic or wind load and is significantly damaged during these events. A sustainable building should be designed to sustain minimal damage due to natural disasters such as hurricanes, tornadoes, earthquakes, flooding and fire. Otherwise, the environmental, economic and societal burden of our built environment could be overwhelming. A building that requires frequent repair and maintenance or complete replacement after disasters would result in unnecessary cost, from both private and public sources, and environmental burdens including the energy, waste and emissions due to disposal, repair and replacement.

It doesn't make sense to design a modern building, commercial or residential, to meet the green code requirements that could be easily destroyed as a result of a hurricane, earthquake or other force of nature. That would mean that all of the green technology and strategies used in the building would go to the landfill. What is the point of installing low flush toilets in a home to conserve water if it ends up in a landfill after a tornado blows through?

Therefore, this proposal provides a performance pathway to demonstrate the environmental impact reduction through resilient design and construction. To meet the requirements of this section, the two designs shall be documented in separate life cycle assessment models, and the material quantities of the structural and non-structural materials over the 75-year building life shall be compared. The assessment shall demonstrate a reduction in life cycle impacts over the buildings lifetime including the impacts of repair and replacement. This section is similar to section 303.1 of this code on Whole Building Life Cycle Assessment except in this case the design is increased over and above the minimum requirements of the IgCC and the IBC such that the project building will resist minimum design loads and other requirements with lower damage than it would otherwise experience during a natural or man-made event.

It is apparent that there needs to be significant shift in how we address natural disasters, moving away from the traditional focus on response and recovery toward emphasis on resiliency, that is, preventive actions to reduce the effects of a natural hazard. The goal of this requirement is to protect the building and its contents in addition to protecting the occupants, resulting in improved performance over the building life reducing environmental, societal and economic burdens of the building.

Bibliography:

[i] National Oceanic and Atmospheric Administration (NOAA) National Climate Data Center. 2011. <http://www.ncdc.noaa.gov/billions>. Accessed October 2013

[ii] Masters, J. 2011. "2011's Billion-Dollar Disasters: Is climate Change to Blame?" Weatherwise, March-April 2012, <http://www.weatherwise.org/Archives/Back%20Issues/2012/MarchApril%202012/dollar-disaster-s-full.html>.

[iii] Swiss Re website. News Release, 27 March 2013, Zurich. http://www.swissre.com/media/news_releases/nr_20130327_sigma_natcat_2012.html. Accessed October 2013

[iv] Weinkle, J., et. al. July 2012. "Historical Global Tropical Cyclone Landfalls" http://sciencepolicy.colorado.edu/admin/publication_files/2012.04.pdf

[v] National Oceanic and Atmospheric Administration (NOAA) National Climate Data Center. 2013. "U.S. Tornado Climatology", <http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html>. Updated May 17, 2013

Cost Impact: Will increase the cost of construction

Will have an impact on initial cost in material selection and design. However, will have a positive cost impact resulting from improved performance over the building life.

GG189-14 : 503.2 (NEW)-PENG790

GG190-14

504.2

Proponent: Kathleen Petrie, City of Seattle, Department of Planning and Development, representing City of Seattle, Department of Planning and Development (kathleen.petrie@seattle.gov)

Delete without substitution:

~~**504.2 Storage of lamps, batteries and electronics.** Storage space shall be provided for fluorescent lamps, high intensity discharge (HID) lamps, batteries, electronics, and other discarded items requiring special disposal by the jurisdiction.~~

Reason: As written, Section 504.1 would require infrastructure for pick-up and/or disposal by the jurisdiction which few may have. The charging language of 504.1 does not specify which materials the waste recycling area is designed for, so it could be inclusive of lamps, batteries and electronics. The deletion of 504.2 does not reduce the intent of this section but it does increase flexibility of the IgCC.

Cost Impact: Will not increase the cost of construction.

GG190-14 : 504.2-PETRIE974

GG191-14

505.1 (New), 505.2 (New), 505.2.1 (New), 505.3 (New), 505 (New)

Proponent: Julius Ballanco, JB Engineering, representing Self (JBENGINEER@aol.com)

Add new text as follows:

SECTION 505 **COMMERCIAL WASTE MANAGEMENT**

505.1 Food handling establishments. Commercial food handling establishments shall manage food waste in accordance with Sections 505.2 through 505.3

505.2 Collection. Food waste shall be separated and collected for beneficial reuse. Pulpers shall not be prohibited for collection of food waste.

505.2.1 Beneficial reuse. The beneficial reuse of food waste shall be through composting or vermiculture, discharge to an anaerobic digester, or fed to livestock.

505.3 Discharge to drainage. Food waste shall be discharged to the sanitary drainage system through a food waste disposer.

Reason: The rate of food waste in the United States is one half pound per person per day. That equates to more than 150,000,000 pounds or 75,000 tons per day of food waste. The vast majority of food waste is currently landfilled, the least preferred method of management according to the US EPA. (<http://www.epa.gov/smm/foodrecovery/>)

The hierarchy of responsible management of food waste begins with reduction, and follows with beneficial reuse, then industrial uses such as anaerobic digestion with energy generation, and then composting. Landfilling and incineration are considered the least favorable options. The most commonly understood beneficial reuse is composting. However, there are other means equal to or better than composting. One such means is the feeding of food waste to livestock. This is done in many locations throughout the United States. Another method is sending the food waste to an anaerobic digester which can generate a substantial amount of energy, as well as beneficially reusable byproducts used for fertilizer.

Food waste disposers can also potentially convert wastes into resources. The food waste can be turned into energy at the waste water treatment plant in an anaerobic digester. The wastewater treatment facility then generates fertilizer as the final byproduct of the process.

All of these methods of treating food waste are more responsible than adding food waste to a landfill. The diversion of food waste from a landfill is very important with the added restriction on landfills. Furthermore, food waste can be used to generate energy.

Cost Impact: Will increase the cost of construction.

GG191-14 : 505 (NEW)-BALLANCO152

GG 192-14

202 (New), 505, 505.1, 505.2

Proponent: Craig Conner, Self, representing self (craig.conner@mac.com); Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Revise as follows:

505.1 Material Building selection material and properties-product environmental declaration. Where buildings have an area that exceeds 10,000 square feet, a minimum of 10 different permanently installed materials or products shall include an *environmental product declaration*. The *environmental product declaration* shall be based on externally verified data. The *environmental product declaration* shall be certified by an *approved agency* or third party in accordance with CAN/CSA-ISO 14025 and ISO 21930.

~~Building materials shall conform to Section 505.2.~~

Exceptions:

- ~~1. Electrical, mechanical, plumbing, security and fire detection, and alarm equipment and controls, automatic fire sprinkler systems, elevators and conveying systems shall not be required to comply with Section 505.2.~~
- ~~2. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505.2 shall not be required.~~

Delete without substitution:

~~**505.2 Material selection.** Not less than 55 percent of the total building materials used in the project, based on mass, volume or cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5. Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material mass, volume or cost shall remain constant regardless of whether materials are tabulated in more than one section.~~

~~**505.2.1 Used materials and components.** Used materials and components shall comply with the provisions for such materials in accordance with the applicable code referenced in Section 102.4 and the applicable requirements of this code.~~

~~**505.2.2 Recycled content building materials.** Recycled content building materials shall comply with one of the following:~~

- ~~1. Contain not less than 25 percent combined post-consumer and preconsumer recovered material, and shall comply with Section 505.2.3.~~
- ~~2. Contain not less than 50 percent combined post-consumer and preconsumer recovered material.~~

~~**505.2.3 Recyclable building materials and building components.** Building materials and building components that can be recycled into the same material or another material with a minimum recovery rate of not less than 30 percent through recycling and reprocessing or reuse, or building materials shall be recyclable through an established, nationally available closed loop manufacturer's take-back program.~~

~~**505.2.4 Bio-based materials.** Bio-based materials shall be those materials that comply with one or more of the following:~~

- ~~1. The bio-based content is not less than 75 percent as determined by testing in accordance with ASTM D 6866.~~
- ~~2. Wood and wood products used to comply with this section, other than salvaged or reused wood products, shall be labeled in accordance with the SFI Standard, FSC STD-40-004~~

~~V2-1 EN, PEFC Council Technical Document or equivalent fiber procurement system. As an alternative to an on-product label, a Certificate of Compliance indicating compliance with the fiber procurement system shall be permitted. Manufacturer's fiber procurement systems shall be audited by an accredited third party.~~

~~3. The requirements of USDA 7CFR Part 2902.~~

~~**505.2.5 Indigenous materials.** Indigenous materials or components shall be composed of resources that are recovered, harvested, extracted and manufactured within a 500-mile (800 km) radius of the building site. Where only a portion of a material or product is recovered, harvested, extracted and manufactured within 500 miles (800 km), only that portion shall be included. Where resources are transported by water or rail, the distance to the building site shall be determined by multiplying the distance that the resources are transported by water or rail by 0.25, and adding that number to the distance transported by means other than water or rail.~~

Add new definition as follows:

SECTION 202 DEFINITIONS

ENVIRONMENTAL PRODUCT DECLARATION. A report for a product or material based on a product's life cycle and other relevant information relevant to its environmental impact.

Add new standard(s) as follows:

CSA

CAN/CSA-ISO 14025-07(R2012) Environmental labels and declarations – Type III environmental declarations – Principles and procedures (Adopted ISO 14025:2006, first edition, 2006-07-01)

ISO

21930-2007 Sustainability in building construction – Environmental declaration of building products

Reason: Section 505 is hard to fail. The section currently recognizes individual product attributes for used, recycled, recyclable, bio-based and indigenous categories. However, these individual product attributes are in aggregate so common as to make it difficult to build without complying with the section. For example, consider concrete and steel, two common heavy materials. Steel averaged 88% recycled content in 2012 (<http://www.recycle-steel.org/Recycling%20Resources/~media/Files/SRI/Releases/003%20Steel%20Recycling%20Rates%20Graphs.pdf>). Common steel products, such as rebar, include more than 95% recycled content. Concrete is typically 60% to 75% aggregate. (<http://www.cement.org/cement-concrete-basics/how-concrete-is-made>) The concrete aggregate, stone and sand, will always be local, certainly well within the 500-mile radius allowed for "indigenous" materials. Many buildings would get to 55% by weight based on the use of steel and concrete alone. The existing Section 505 becomes "busy work" that bulks up the IgCC with unneeded calculation and record keeping. This proposal deletes the existing Section 505.

This code change proposal substitutes Environmental Product Declarations (EPDs). EPDs are emerging as one way to compare the environmental performance of competing products, including impacts from manufacturing and ultimately disposal. EPDs would include all the product attributes in the existing section. The new section would also encourage manufacturers to reduce their environmental impacts by making it more likely that product buyers will compare competing products based on a broad set of environmental attributes.

Enforcing the new section is simple for the building official. No new building-level calculations are required by the new section. If there are 10 EPDs for products in the building, the criteria would be met. ANSI has begun an accreditation program for organizations that certify EPDs.

Cost Impact: Will increase the cost of construction. This code change proposal would increase costs to the manufacturer who chooses to obtain an EPD for their building product.

GG 192-14 : 505 (NEW)-CONNER1215

GG193-14

505.1

Proponent: Tim Earl, representing North American Flame Retardants Alliance
(tearl@gbhinternational.com)

Revise text as follows:

505.1 Material selection and properties. Building materials shall conform to Section 505.2. Combustible building materials in Type I and Type II Construction shall conform to Section 603 of the International *Building Code*®.

Exceptions:

1. Electrical, mechanical, plumbing, security and fire detection, and alarm equipment and controls, automatic fire sprinkler systems, elevators and conveying systems shall not be required to comply with Section 505.2.
2. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505.2 shall not be required.

Reason: It is essential to ensure that the combustible building materials that are permitted to be used in IgCC buildings do not conflict with the essential fire safety requirements for combustible materials that are built into the structure of the IBC, as shown in section 603 of the IBC.

Section 603 of the IBC (Combustible Materials in Type I and II Construction) contains details of the allowable materials permitted in those applications. These allowable combustible materials are fire-retardant-treated wood, thermal and acoustical insulation, foam plastics, roof coverings with an A, B or C classification, *interior floor finish* and floor covering materials, millwork such as doors, door frames, window sashes and frames, *interior wall and ceiling finishes*, *interior trim*, show windows, nailing or furring strips and wooden bulkheads below show windows, finish flooring, partitions dividing portions of stores, offices or similar places, stages and platforms, combustible *exterior wall coverings*, balconies and similar projections, blocking such as for handrails, millwork, cabinets and window and door frames, light-transmitting plastics, mastics and caulking materials applied to provide flexible seals, exterior plastic veneer, nailing or furring strips, heavy timber, aggregates, component materials and admixtures, sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, materials used to protect penetrations in fire resistance-rated assemblies, materials used to protect joints in fire-resistance-rated assemblies, materials allowed in the concealed spaces of buildings of Types I and II construction, and materials exposed within plenums complying with Section 602 of the *International Mechanical Code*.

Cost Impact: Will not increase the cost of construction.

GG193-14 : 505.1-EARL982

GG194-14

202 (New), 505.2, 505.2.6 (New), 505.2.6.1 (New)

Proponent: Paul Coats, American Wood Council, representing American Wood Council
(pcoats@awc.org)

Add new definitions follows:

SECTION 202 DEFINITIONS

Environmental Product Declaration. A document that shows a product's potential environmental impact by providing quantified data.

Revise as follows:

505.2 Material selection. Not less than ~~55~~75 percent of the total building materials used in the project, based on mass, volume or cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5. Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The percentage shall be further adjusted in accordance with Section 505.2.6. The value of total building material mass, volume or cost shall remain constant regardless of whether materials are tabulated in more than one section.

505.2.6 Environmental Product Declarations. For the purposes of Section 505.2, the percentages of building materials with environmental product declarations in accordance with Section 505.2.6.1 shall be multiplied by 1.5.

505.2.6.1 Environmental Product Declarations Compliance. Environmental product declarations shall comply with ISO 21930 and ISO 14025, and shall include at least the production stage of the life cycle for the building products or cradle-to-gate. Life cycle assessment data used for environmental product declarations shall be in accordance with the principles of ISO 14040 and ISO 14044.

Add new standard(s) as follows:

ISO 14025-2006 Environmental labels and declarations—Type III environmental declarations—Principles and procedures

ISO 14040-2006 Environmental management-Life cycle assessment—Principles and framework

ISO 21930-2007 Sustainability in building construction—Environmental declaration of building products

Reason: Environmental Product Declarations are an internationally recognized tool for disclosing the potential environmental impacts of products. When properly implemented they become essential to the true effectiveness of many provisions in the IgCC. The goal of this proposed change is to encourage the use of EPDs.

This makes no change to the application of Section 505.2 except to take the percentages of materials complying with any particular subsection at a value of 1.5 times the actual percentage. For instance, if 50% of materials are recycled in accordance with 505.2.2, they are taken at 75% (50% x 1.5) if the recycled materials have EPDs in accordance with the listed standards. By structuring the extra credit in this way, materials with EPDs must still qualify under the current code sections (for used, recycled, recyclable, bio-based, or indigenous materials) to be considered.

Because of the increased credit given, it seems appropriate to increase the required percentage of complying materials from 55% to 75%.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ISO 14025:2006, 14040:2006 and 21930:2007 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG195-14

505.2, 505.2.1, 505.2.2, 505.2.3, 505.2.4, 505.2.5, 505.2.6 (New)

Proponent: Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org)

Revise as follows:

505.2 Material selection. Not less than 55 percent of the total building materials used in the project, based on mass, volume or cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4, ~~or 505.2.5, or 505.2.6.~~ Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material mass, volume or cost shall remain constant regardless of whether materials are tabulated in more than one section.

505.2.1 Used materials and components. Used materials and components shall comply with the provisions for such materials in accordance with the applicable code referenced in Section 102.4 and the applicable requirements of this code.

505.2.2 Recycled content building materials. Recycled content building materials shall comply with one of the following:

1. Contain not less than 25 percent combined post-consumer and preconsumer recovered material, and shall comply with Section 505.2.3.
2. Contain not less than 50 percent combined post-consumer and preconsumer recovered material.

505.2.3 Recyclable building materials and building components. Building materials and building components that can be recycled into the same material or another material with a minimum recovery rate of not less than 30 percent through recycling and reprocessing or reuse, or building materials shall be recyclable through an established, nationally available closed loop manufacturer's take-back program.

505.2.4 Bio-based materials. Bio-based materials shall be those materials that comply with one or ~~more~~ both of the following:

1. The bio-based content is not less than 75 percent as determined by testing in accordance with ASTM D 6866.
2. ~~Wood and wood products used to comply with this section, other than salvaged or reused wood products, shall be labeled in accordance with the SFI Standard, FSC STD 40-004 V2-1 EN, PEFC Council Technical Document or equivalent fiber procurement system. As an alternative to an on-product label, a Certificate of Compliance indicating compliance with the fiber procurement system shall be permitted. Manufacturer's fiber procurement systems shall be audited by an accredited third party.~~
3. The requirements of USDA 7CFR Part 2902.

505.2.5 Indigenous materials. Indigenous materials or components shall be composed of resources that are recovered, harvested, extracted and manufactured within a 500 mile (800 km) radius of the building site. Where only a portion of a material or product is recovered, harvested, extracted and manufactured within 500 miles (800 km), only that portion shall be included. Where resources are transported by water or rail, the distance to the building site shall be determined by multiplying the distance that the resources are transported by water or rail by 0.25, and adding that number to the distance transported by means other than water or rail.

505.2.6 (New) Certified Wood Products. Wood products shall be *labeled* in accordance with the SFI Standard, FSC Indicators of Sustainable Forestry, PEFC Council Technical Document, or an equivalent fiber procurement system. As an alternative to an on-product *label*, a certificate of compliance indicating conformance with the fiber procurement system shall be required. Manufacturer's fiber procurement systems shall be audited by an accredited third-party.

Reason: Currently, by being a single item in subsection 505.2.4, wood products receive no additional credit for coming from sustainable forests. Sustainable forestry, verified by one of the referenced programs in 505.2.4, is a different concept from carbon sequestration. As currently structured, Section 505.2.4 Bio-based materials recognizes the positive environmental impact of the products that sequester carbon. This proposal separates the positive impacts of sustainability (through forest certification programs) from the positive impacts of carbon sequestration (biomass). This will also encourage the use of standardized fiber procurement systems for wood products.

This change makes no changes to the item wording, it simply moves it to its own subsection.

Cost Impact: Will not increase the cost of construction.

GG195-14 : 505.2 #2-COATS747

GG196-14

505.2, 505.2.5

Proponent: David Collins, Preview Group, representing The American Institute of Architects
(dcollins@preview-group.com)

Revise as follows:

505.2 Material selection. Not less than 55 percent of the total building materials used in the project, based on ~~mass, volume or~~ cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5. Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material ~~mass, volume or~~ cost shall remain constant regardless of whether materials are tabulated in more than one section.

505.2.5 Indigenous Regional materials. ~~Indigenous~~ Regional materials or components shall be composed of resources that are recovered, harvested, extracted and manufactured within a 500 mile (800 km) radius of the building site. Where only a portion of a material or product is recovered, harvested, extracted and manufactured within 500 miles (800 km), only that portion shall be included. Where resources are transported by water or rail, the distance to the building site shall be determined by multiplying the distance that the resources are transported by water or rail by 0.25, and adding that number to the distance transported by means other than water or rail.

Reason: Section 505.2 was simplified by removing the mass and volume option and simplifying to only require cost of the material.

Section 505.2.5 was changed to use "regional" materials in lieu of indigenous because indigenous materials implies that the material is native to a specific region. This section was not written to exclude non-native materials. For example, bamboo flooring could be harvested and manufactured at a farm in Louisiana and installed in a home in Houston. Although bamboo is not a native species to the Gulf Coast, it is still a regional material.

Cost Impact: Will not increase the cost of construction.

GG196-14 : 505.2-COLLINS386

GG197-14

505.2, 505.2.6 (New)

Proponent: Chad Diercks, representing James Hardie Building Products, Inc.
(chad.diercks@jameshardie.com)

Revise as follows:

505.2 Material selection.

Not less than 55 percent of the total building materials used in the project, based on mass, volume or cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4, ~~or~~ 505.2.5 or 505.2.6. Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material mass, volume or cost shall remain constant regardless of whether materials are tabulated in more than one section.

Add new text as follows:

505.2.6 Prefinished materials. For categories listed in items 1 through 6 below, prefinished materials shall be materials used for finishing applications that do not require site-applied finishing other than those associated with attachment.

1. Interior or exterior wall coverings
2. Interior or exterior trim
3. Interior or exterior window assemblies
4. Interior or exterior door assemblies
5. Skylight assemblies
6. Other manufactured systems or materials where justified by the manufacturer and approved by the code official.

Reason: This addition creates some consistency with ICC 700-2012 National Green Building Standard™ Section 601.7. It is a known fact that prefinished materials:

1. Reduce site liquid waste (waste is minimized and recycled in a factory setting),
2. Minimize potential exposure to VOCs on site during construction, and
3. Eliminate the need to store large amounts of paint on site.

Refinishing in a factory controlled climate controlled environment also provides the customer a finish that has been put through multiple factory quality control checkpoints minimizing the need for rework in field.

Cost Impact: Will not increase the cost of construction.

GG197-14 : 505.2-DIERCKS1167

GG198-14

505.2, 505.2.6 (New)

Proponent: Matthew Dobson, Vinyl Siding Institute, representing Vinyl Siding Institute
(mdobson@vinylsiding.org)

Revise as follows:

505.2 Material selection. Not less than 55 percent of the total building materials used in the project, based on mass, volume or cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4, ~~or 505.2.5, or 505.2.6.~~ Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material mass, volume or cost shall remain constant regardless of whether materials are tabulated in more than one section.

Add new text as follows:

505.2.6 Environmental Product Declarations. Environmental product declarations shall be provided for materials based on product category rules in accordance with ISO 14025. Environmental product declarations shall be based on independently reviewed life cycle assessment in accordance with ISO 14044. The environmental product declaration and product category rules program shall be operated by an accredited third party.

Add new standard(s) as follows:

ISO

14025:2006 Environmental labels and declarations—Type III environmental declarations—Principles and procedures

Reason: This change offers a viable option for material selection based on transparency and accountability. By encouraging manufactures to publish EPDs based on established Product Category Rules it will provide specifiers with comprehensive and complete information. This well accepted practice will encourage a stronger understanding about how materials and manufacturing processes impact the environment. Additionally in the long run it will encourage more intelligent decisions by both specifiers and manufactures. This change will create a level playing field based on sound accepted Life Cycle Assessment science. It is a good option to add to the current list.

Cost Impact: Will increase the cost of construction. There is cost involved with the development of EPDs and PCRs but in general the cost to implement by manufactures is minimal.

Analysis: A review of the standard proposed for inclusion in the code, ISO 14025:2006 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG198-14 : 505.2-DOBSON893

GG199-14

505.2, A105.3

Proponent: Jonathan Humble, AIA, NCARB, LEED AP-BD&C American Iron and Steel Institute, representing the American Iron and Steel Institute (jhumble@steel.org)

Revise as follows:

A105.3 Material selection project electives. Each of the following shall be considered a separate material selection project elective. The project electives are cumulative and compliance with each item shall be recognized individually.

1. Compliance with this project elective shall require compliance with Section 505.2, except that buildings and structures shall contain used, recycled content, recyclable, bio-based and indigenous materials that comply with Sections 505.1 through 505.2.5 such that the aggregate total materials compliant with those sections constitute at least 70 percent of the total building products and materials used, based on mass, ~~volume~~ or cost, used singularly or in combination.
2. Compliance with Item 1 except that such materials shall be used for at least 85 percent of the total mass, ~~volume~~ or cost of materials in the project.

505.2 Material selection. Not less than 55 percent of the total building materials used in the project, based on mass, volume or cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5. Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material mass, ~~volume~~ or cost shall remain constant regardless of whether materials are tabulated in more than one section.

Reason: We are proposing to delete the term "volume" from Section 505.2 and Section A105.3. The problem that arises is that the term as used in this context is not consistent in application with the terms "cost" or "mass". Further, unlike other provisions of the I-codes and the IgCC where the term volume is used, we would point out that it is used successfully as the term does have a qualifier for its measurement (e.g. Plumbing, site materials, construction waste, energy provisions and interior conditioned space, adhesive or sealants chemical makeup, etc.) and where the trade normally applying this term has experience with the term "volume".

Volume in this case can have a manifold of definitions since there is no qualifier for its application. From a measurement perspective, one could apply the following measurement methodologies and be correct since there are no such benchmarks for a user to apply, as follows:

- Measure the dimensional volume of each material.
- Measure the volume of a space, which could include the air within.
- Measure scientifically based on water displacement.

But if an A/E firm uses the BIM (Building Information Modeling) process for design this application allows for the volume of products and materials to be calculated, so why change? The issue is when BIM is not used. As noted earlier, the variations for hand calculating are too liberal to warrant this option to be applied to anything other than the BIM process.

In view of this liberal opportunity to apply this term we propose that the term "volume" be deleted without substitution in Sections 505.2 and A105.3.

Cost Impact: Will not increase the cost of construction

GG199-14 : 505.2-HUMBLE723

GG200-14

505.2

Proponent: Brenda Thompson, Chair, ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

505.2 Material selection. Not less than 55 percent of the total building materials used in the project, based on ~~mass, weight~~, volume or cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5. Where a material complies with more than one section, the material ~~value-weight, volume or cost~~ shall be multiplied by the number of sections that it complies with. The value of total building material ~~mass, weight~~, volume or cost shall remain constant regardless of whether materials are tabulated in more than one section.

Reason: This proposal replaces the term “mass” with “weight” so as to eliminate any confusion as to how mass might be calculated. This also coordinates with related language in Sections 806.2 and 806.3.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG200-14 : 505.2 #1-THOMPSON318

GG201-14

505.2, A105.3

Proponent: Jason Thompson, representing NCMA/MACS (jthompson@ncma.org)

Revise as follows:

505.2 Material selection. Not less than 55 percent of the total building materials used in the project, based on ~~mass, volume or~~ cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5. Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material ~~mass, volume or~~ cost shall remain constant regardless of whether materials are tabulated in more than one section.

A105.3 Material selection project electives. Each of the following shall be considered a separate material selection project elective. The project electives are cumulative and compliance with each item shall be recognized individually.

1. Compliance with this project elective shall require compliance with Section 505.2, except that buildings and structures shall contain used, recycled content, recyclable, bio-based and indigenous materials that comply with Sections 505.1 through 505.2.5 such that the aggregate total materials compliant with those sections constitute at least 70 percent of the total building products and materials used, based on ~~mass, volume or~~ cost, used singularly or in combination.
2. Compliance with Item 1 except that such materials shall be used for at least 85 percent of the total ~~mass, volume or~~ cost of materials in the project.

Reason: In the development of the first edition of the IgCC there was lengthy debate regarding the means by which recycled materials are to be measured. Certainly some materials benefit when measured by mass, others by volume, and yet others by cost. Providing all options, however, does little to advance sustainable design objectives. While no single means of measurement is ideal for all circumstances, using the material cost as a baseline is the most equitable for consistent application.

Cost Impact: Will not increase the cost of construction

GG201-14 : 505.2 #2-THOMPSON877

GG202-14

505.2, 505.2.1, 505.2.2, 505.2.3, 505.2.4, 505.2.5, 505.2.6 (New)

Proponent: John Woestman, Kellen Company, representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com)

Delete and substitute as follows:

505.2 Material selection. Not less than 20 different permanently installed materials or products from not less than five different manufacturers shall comply with one or more of the following sections: 505.2.1, 505.2.2, 505.2.3, 505.2.4, 505.2.5 or 505.2.6.

~~Not less than 55 percent of the total building materials used in the project, based on mass, volume or cost, shall comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5. Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material mass, volume or cost shall remain constant regardless of whether materials are tabulated in more than one section.~~

Add new text as follows:

505.2.6 Building materials and products with a Type III Environmental Product Declaration. The Type III Environmental Product Declaration (based on externally verified data shall be certified by an approved agency in accordance with CAN/CSA-ISO 14025 and ISO 21930.

Add new standard(s) as follows:

CSA

CAN/CSA-ISO 14025:07(R2012) Environmental labels and declarations – Type III environmental declarations – Principles and procedures(Adopted ISO 14025:2006, first edition, 2006-07-01)

ISO

21930:2007 Sustainability in building construction – Environmental declaration of building products

Reason: Section 505 currently recognizes individual product attributes for used, recycled, recyclable, bio- based and indigenous categories. It does not recognize products that have undergone a full life cycle assessment of their product to develop an Environmental Product Declaration (EPD).

This code change proposal adds EPDs, which have the advantage of capturing the environmental impacts across all phases of a product life cycle. It provides recognition to product manufacturers who have undertaken the time and expense to examine their environmental impact upstream and downstream of their manufacturing process. EPDs encourage manufacturers to reduce their environmental impacts.

CAN/CSA-ISO 14025 is the reference standard for EPDs. ISO 21930 is a companion standard to ISO 14025, and specifies the declaration of environmental impacts such as:

- Global warming potential
- Depletion of the upper ozone layer
- Acidification of land and water sources
- Smog formation
- Excess nutrient formation in water bodies (eutrophication)
- Use of renewable and non-renewable material resources and energy
- Hazardous waste
- Freshwater consumption

The majority of building products EPDs include these impacts. The building official enforcing this new language need only request an EPD from an approved agency, to ensure EPD conformance to the ISO standards. The agency (Program Operator as defined in the ISO standards), is responsible to ensure that the life cycle practitioners and personnel involved in the development of Product Category Rules and certification of the EPD have sufficient expertise and have followed the appropriate procedures.

At the time of this submission, ANSI has launched an accreditation program for organizations that certify EPDs. The accreditation program will ensure that the Program Operator has the appropriate documentation and procedures to act as a certification body to the referenced standards.

The weighting criteria in the charging section of Section 505.2 has been simplified to require a minimum of 20 different permanently installed materials or products from a minimum of five different manufacturers to comply with one or more of the six sections. This language was adapted from MR credits in LEED version 4. This greatly simplifies compliance – there is no need to calculate percentages or double count materials for more than one section. For example, a designer could submit 20 certified EPDs for the project and the code official would only need to verify that the Program Operator is accredited and that the EPD is referenced in a current listing.

This proposal increases the transparency of building materials and product environmental impacts and simplifies compliance.

Cost Impact: Will not increase the cost of construction. This code change proposal will not increase the cost of construction but will involve costs to the manufacturer who voluntarily obtains an EPD for their building product.

Analysis: A review of the standards proposed for inclusion in the code, CAN/CSA-ISO 14025:07(R2012) and ISO21930:2007 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG202-14 : 505.2-WOESTMAN1048

GG203-14

202 (New), 505.2.2

Proponent: Richard Krock, representing The Vinyl Institute (rkrock@vinylinfo.org)

Revise as follows:

505.2.2 Recycled content building materials. Recycled content building materials shall comply with one of the following:

1. Contain not less than 25 percent combined post-consumer and preconsumer recovered material, and shall comply with Section 505.2.3.
2. Contain not less than 50 percent combined post-consumer and preconsumer recovered material.
3. For products that are made of plastic and that comply with Section 505.2.3, contain not less than 2 percent combined post-consumer and pre-consumer recovered material.
4. For products that are made of plastic, contain not less than 25 percent combined post-consumer and pre-consumer recovered material.

Add new definitions as follows:

SECTION 202 DEFINITIONS

POLYMERIC MATERIAL. A material or product that is composed of, in-whole or in-part, polymers that are created by the process of polymerization or the joining together of organic chemical structures (monomers), derived from natural or synthetic raw materials, to form large molecules containing many repeating organic chemical units. Polymeric materials are generally categorized as thermoplastic or thermosetting, and can be formulated to contain additives including inorganic or organic chemical fillers, fibers, reinforcements, pigments, and non-polymeric ingredients depending on the end use application of the product.

PLASTIC. See "Polymeric material"

Reason: The additions submitted in this change move closer to the intent of **driving recycle content up in building materials** and to **count all recycle content in a building**. The primary reason offered in support of this code change is that Section 505.2.2 creates an arbitrary hurdle of a minimum of 25% recycle content which is impractical for most polymeric material building products. The change proposed above removes this subjectivity and credits all recycle material incorporated into a product in some way.

In support of this change, it is important to understand that each type and grade of polymeric recycle material can only be used with that same type and grade of virgin material for processing and finished part performance reasons. For instance, polyethylene recyclate should not be mixed into PVC polymer materials, or nylon recyclate should not be mixed into ABS polymer materials if acceptable physical properties or cosmetic appearances in the finished product are necessary.

Additional support of the proposed change is that recognition in certain polymeric products standards where incorporating recycle content is prohibited in order not to impair the end use performance and durability of the product. For example, certain ASTM standards for polymeric pressure pipe and fittings, currently do not allow recycled content other than in-plant regrinds. Using recycled content other than in-plant regrinds would be very difficult for polymeric pressure pipe because of the extensive long term strength testing scheme assumes the use of virgin material or regrinds of the exact same formulation. Recognizing that plumbing is excluded from this section's requirements, the ASTM restriction illustrates the care that needs to be taken by any polymeric product producer when using recycle content material.

This proposed change recognizes and rewards those polymeric product manufacturers that document formulations and process streams from consistent sources of recycled plastic materials in order to incorporate recycle content into their products.

Recycle content credit for all building materials is an important objective in order to drive **landfill avoidance**, and this contributes to the sustainability efforts in the building industry. Achievable thresholds for all types of building materials are necessary for this to be accomplished.

Cost Impact: Will not increase the cost of construction. No increase in cost of construction is expected.

GG203-14 : 505.2.2-KROCK796

GG204-14

505.2.2.1 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

505.2.2.1 Recycled Asphalt. Asphaltic concrete used in the project shall contain not less than 30 percent reclaimed asphalt pavement, as measured by weight. Heavy duty asphaltic concrete shall contain not less than 10 percent reclaimed asphalt pavement, as measured by weight.

Reason: Using recycled asphalt pavement prevents asphalt from entering landfills. Recycled asphalt is widely available.

New York City will require 30% recycled asphalt in most street paving and building construction starting in 2015.

Bibliography:

NYC Green Codes Task Force, Resource Conservation Proposal 4 ([Proposal](#)) NYC Local Law 71 of 2011 ([Law](#); [Legis. Summary](#))

NYC Administrative Code Sec. 19-113, 27-652

NYC Building Code Sec. 1918 ([Code reference](#))

Cost Impact: Will not increase the cost of construction.

GG204-14 : 505.2.2.1 (NEW)-SCHEIB1125

GG205-14

505.2.3

Proponent: Michael Gardner, Gypsum Association, representing Gypsum Association
(mgardner@gypsum.org)

Revise as follows:

505.2.3 Recyclable building materials and building components. Recyclable building materials and building components shall comply with one of the following:

1. Building materials or components that can be recycled into the same material or another material with a minimum recovery rate of not less than 30 percent through recycling and reprocessing or reuse., ~~or~~
- 2. Building materials shall be that are recyclable through an established, nationally available closed loop manufacturer's take-back program.

Reason: Because of the multiple changes effected to Section 505.2.2 during the previous cycle, the current text reads like a definition. Proposal simply re-casts text in a more appropriate format.

Cost Impact: Will not increase the cost of construction.

GG205-14 : 505.2.3-GARDNER462

GG206-14

505.2.3

Proponent: Jason Thompson, representing NCMA/MACS (jthompson@ncma.org)

505.2.3 Recyclable building materials and building components. Building materials and building components that can be recycled into the same material or another material with a minimum recovery rate of not less than 30 percent through recycling and reprocessing or reuse, or building materials shall be recyclable through an established, ~~nationally available~~ closed loop manufacturer's take-back program.

Reason: Many materials are sourced, manufactured and used locally without any form of a national distribution network. Requiring a nationally available take-back program for these materials is impractical and counterproductive to the sustainable objectives of the IgCC.

Cost Impact: Will not increase the cost of construction.

GG206-14 : 505.2.3-THOMPSON878

GG207-14

505.2.4

Proponent: Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org)

Revise as follows:

505.2.4 Bio-based materials. Bio-based materials shall be those materials that comply with one or more of the following:

1. The bio-based content is not less than 75 percent as determined by testing in accordance with ASTM D 6866.
2. Wood and wood products used to comply with this section, other than salvaged or reused wood products, shall be labeled in accordance with ~~the SFI Standard, FSC STD-40-004 V2-1 EN, PEFC Council Technical Document~~ the Sustainable Forestry Initiative (SFI), the Forestry Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification (PEFC), or equivalent *fiber procurement system*. As an alternative to an on-product label, a Certificate of Compliance indicating compliance with the *fiber procurement system* shall be permitted. Manufacturer's *fiber procurement systems* shall be audited by an accredited third-party.
3. The requirements of USDA 7CFR Part 2902.

Add new standard(s) as follows:

Sustainable Forestry Initiative Inc.
900 17th Street, NW, Suite 700
Washington, DC 20006

Sustainable Forestry Initiative (SFI) -No date

Forest Stewardship Council U.S. (FSC-US)
212 Third Avenue North, Suite 445
Minneapolis, MN 55401

Forestry Stewardship Council (FSC) -No date

PEFC International
10, Route de l'Aéroport

Case Postale 636
1215 Geneva - Switzerland

Programme for the Endorsement of Forest Certification (PEFC) -No date

Reason: Reference to credible forest certification programs alone is sufficient and advantageous. The objective of the criteria is to provide the code official with guidance when looking for on-product labels which meet this sustainability attribute. Products labeled according to the requirements of these programs ensure the wood comes from a responsibly managed forest. In the case of fiber procurement and forest certification, labels demonstrate compliance with the label programs. The code official only needs to verify labeling by one of the acceptable, credible forest certification organizations to determine compliance with the standards emanating from those organizations. This compliance is further verified by third party verification.

This approach will permit the latest requirements of the certification standards to be recognized by the IgCC

Sustainable Forestry Initiative (SFI) <http://www.sfiprogram.org/>

Forestry Stewardship Council (FSC) <https://us.fsc.org/>

Programme for the Endorsement of Forest Certification (PEFC) <http://pefc.org/>

Cost Impact: Will not increase the cost of construction.

Analysis: The programs referenced in this proposal, Sustainable Forestry Initiative (SFI), Forestry Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) must be considered as a referenced standards and therefore Section 3.6 of CP#28 is applicable. Regarding Section 3.6.1, these programs are not promulgated by a consensus process such as ANSI or ASTM.

GG207-14 : 505.2.4-COATS746

GG208-14

505.2.4

Proponent: Mark Nowak, representing Steel Framing Alliance

Revise as follows:

505.2.4 ~~Bio-based materials~~ Wood and wood products. ~~Bio-based materials shall be those materials that comply with one or more of the following:~~

- ~~1. The bio-based content is not less than 75 percent as determined by testing in accordance with ASTM D 6866.~~
2. Wood and wood products used to comply with this section, other than salvaged or reused wood products, shall be labeled in accordance with the SFI Standard, FSC STD-40-004 V2-1 EN, PEFC Council Technical Document or equivalent *fiber procurement system*. As an alternative to an on-product label, a Certificate of Compliance indicating compliance with the *fiber procurement system* shall be permitted. Manufacturer's *fiber procurement systems* shall be audited by an accredited third-party.
- ~~3. The requirements of USDA 7CFR Part 2902.~~

Reason: Section 505.2 addresses materials generically except Section 505.2.4, which is specific to bio-based products. The existing text would permit materials, by virtue of Section 505.2.4, to comply simply because they are defined as a bio-based product.

Being a bio-based material in itself does not make a product green or sustainable. The other requirements in this section are based on attributes that can be connected to verifiable sustainability outcomes such as recycled content or lower emissions due to reduced transportation distances. However, the addition of bio-based materials for compliance is a procurement preference established by the Federal Government. It does not increase sustainability by using these products.

Reference to the USDA Standard or its rationale is inappropriate in a building code. The Federal government's decision to declare bio-based materials as preferable for procurement purposes does not make those products any more green. Bio-based products should have to meet the same requirements in Sections 502.2 as other materials. This proposal achieves that objective while maintaining the requirements for wood products used for framing and other applications in buildings.

Cost Impact: Will not increase the cost of construction

GG208-14 : 505.2.4-NOWAK336

GG209-14

505.2.5, A105.3

Proponent: Jonathan Humble, AIA, NCARB, LEED AP-BD&C American Iron and Steel Institute, representing the American Iron and Steel Institute (jhumble@steel.org)

Revise as follows:

505.2.5 Indigenous Regional materials. ~~Indigenous-Regional~~ materials or components shall be composed of resources that are recovered, harvested, extracted ~~and or~~ manufactured within a 500 mile (800 km) radius of the building site. Where only a portion of a material or product is recovered, harvested, extracted and manufactured within 500 miles (800 km), only that portion shall be included. Where resources are transported by water or rail, the distance to the building site shall be determined by multiplying the distance that the resources are transported by water or rail by 0.25, and adding that number to the distance transported by means other than water or rail.

A105.3 Material selection project electives. Each of the following shall be considered a separate material selection project elective. The project electives are cumulative and compliance with each item shall be recognized individually.

1. Compliance with this project elective shall require compliance with Section 505.2, except that buildings and structures shall contain used, recycled content, recyclable, bio-based and ~~indigenous-regional~~ materials that comply with Sections 505.1 through 505.2.5 such that the aggregate total materials compliant with those sections constitute at least 70 percent of the total building products and materials used, based on mass, volume or cost, used singularly or in combination.
2. Compliance with Item 1 except that such materials shall be used for at least 85 percent of the total mass, volume or cost of materials in the project.

Reason: We are proposing to change the terminology from "indigenous" to "regional", and we propose to modify the intent by changing from "and" to "or" in the list of resource categories.

Indigenous versus Regional

The term "indigenous" is a term that does not accurately reflect the contents of the provision. When applying the more popular dictionary definitions we find the following definitions for "indigenous":
Merriam-Webster

1. Having originated in an being produced, growing, or living naturally in a particular region or environment
2. Being born or innate

The free dictionary

1. Originating and living or occurring naturally in an area or environment
2. Intrinsic, innate

However, the term "regional" we would stipulate is more appropriate for these provisions as the definition portrays the intent of the mandatory language, as shown below:

Merriam-Webster

1. Affecting a particular region
2. Or, relating to, characteristic of, or serving a region

The Free Dictionary

1. Of or relating to a large geographic region
2. Of or relating to a particular region or district

The Law Dictionary

1. This term refers to a small, geographical area.

Notice that the definition of indigenous does not accurately reflect the intent of this section. By definition it assumes that the components of a product or material are growing or found, manufactured, and processed in a single area or local environment. We view this as too restrictive as it may apply to only a few manufactures of products and thus creates a disparity for any manufacture not within, or who obtains materials that make up that product not within, that area demarcation. Our proposal is to modify the term to regional in order to reflect current and achievable results of products manufactured in a single area, and to recognize that not all components which may go into a product can be generated from that single regional area.

The use of the term indigenous suggests that all product acquisition and manufacturing take place within that demarcated circle, however the utilization of this method is flawed as it does not take into consideration economic and environmental feasibilities. The provision also emphasizes location over quality by illustrating preference to local products only. We feel that this use of the word "indigenous" is too restrictive and not conducive to the overall goal of sustainability in design and construction.

And versus Or

We believe that the application of the term "and" is too stringent in this section. By default, the provision assumes that all regions of the US and beyond contain enough raw and manufactured materials from which to supply the needs of any project within that designated project area (In this case 500 miles). This is not accurate. For example, geologically, we know that each region of the US is different and therefore cannot be expected to supply all the necessary materials for a complete building. Further, from a manufacturing perspective the use of the term "and" favors manufacturers which can operate small plants in a region, and does not favor the moderate or larger manufacturers which operate in specific areas of the continent. We would submit that it would be far more effective to temper the provisions with the use of the term "or" in order to take advantage of the potential of optimization the facilities which can operate effectively and efficiently in terms of production and environment.

Cost Impact: Will not increase the cost of construction

GG209-14 : 505.2.5-HUMBLE725

GG210-14

505.2.5

Proponent: John Woestman, Kellen Company, representing Extruded Polystyrene Foam Association (XPSA), representing Kellen Company, representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com)

Revise as follows:

505.2.5 Indigenous materials. Indigenous materials or components shall be composed of resources that are recovered, harvested, extracted ~~and~~or manufactured within a 500 mile (800 km) radius of the building site. Where only a portion of a material or product is recovered, harvested, extracted ~~and~~or manufactured within 500 miles (800 km), only that portion shall be included. Where resources are transported by water or rail, the distance to the building site shall be determined by multiplying the distance that the resources are transported by water or rail by 0.25, and adding that number to the distance transported by means other than water or rail.

Reason: The green building codes cited below define the "regional" or "indigenous" materials differently than the IgCC. Specifically, all the other green codes permit materials to be: recovered, harvested, extracted "OR" manufactured within 500 miles. The IgCC uses the terms: recovered, harvested, extracted "AND" manufactured within 500 miles.

This code change proposal will make the calculation of indigenous materials more harmonious with other green codes/standards, such that manufacturers can make a distance claim in a consistent fashion.

2010 Title 24, Part 11, California Green Building Standards Code (CALGreen, including July 1, 2012 Supplement)

A5.405.1 Regional materials. Compared to other products in a given product category, select building materials or products for permanent installation on the project that have been harvestedor manufactured in California or within 500 miles of the project site.

2012 National Green Building Standard (ICC 700)

Section 202. Regional Material.

REGIONAL MATERIAL. Material that is originated, produced, grows naturally, ~~or~~occurs naturally within 500 miles (804.7 km) of the construction site if transported by truck or 1500 miles (2414 km) of the construction site if transported for not less than 80% of the total transport distance by rail or water.

ANSI/ASHRAE/USGBC/IES Standard 189.1-2011 (as referenced in the 2012 IgCC)

9.4.1.2 Regional Materials. A minimum of 15% of building materials or products used, based on cost, shall be regionally extracted/harvested/recovered or manufactured within a radius of 500 mi (800 km) of the project site.

Cost Impact: Will not increase the cost of construction. There is no anticipated construction cost increase as a result of approving this code proposal.

GG210-14 : 505.2.5-WOESTMAN1054

GG211-14

302.1, 505.3 (New), 505.3.1 (New)

Proponent: Robert Eugene, UL LLC, representing UL LLC (robert.eugene@ul.com)

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements
CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY		
503.1	Minimum percentage of waste material diverted from landfills	<input type="checkbox"/> 50% <input type="checkbox"/> 65% <input type="checkbox"/> 75%
505.3	<u>Hail impact resistance roof coverings</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

Add new text as follows:

505.3 Roof coverings subject to hail exposure. Where indicated by Table 302.1, roof coverings used in regions where hail exposure is moderate or severe, as determined in accordance with Section 505.3.1 and Figure 505.3 shall be tested, listed, and labeled as Class 3 or Class 4 respectively in accordance with UL2218.

505.3.1 Hail exposure regions. Hail Exposure regions in Figure 505.3.1 shall be as follows:

1. Moderate - One or more hail days with hail diameters greater than 1.5 in (38 mm) in a 20 year period.
2. Severe - One or more hail days with hail diameters greater than 2.0 in (50 mm) in a 20 year period.

■ Moderate Size (1.5 - 5.0 in.): Minimum 1 hail day/20 years
■ Severe Size (2.0 - 5.0 in.): Minimum 1 hail day/20 years

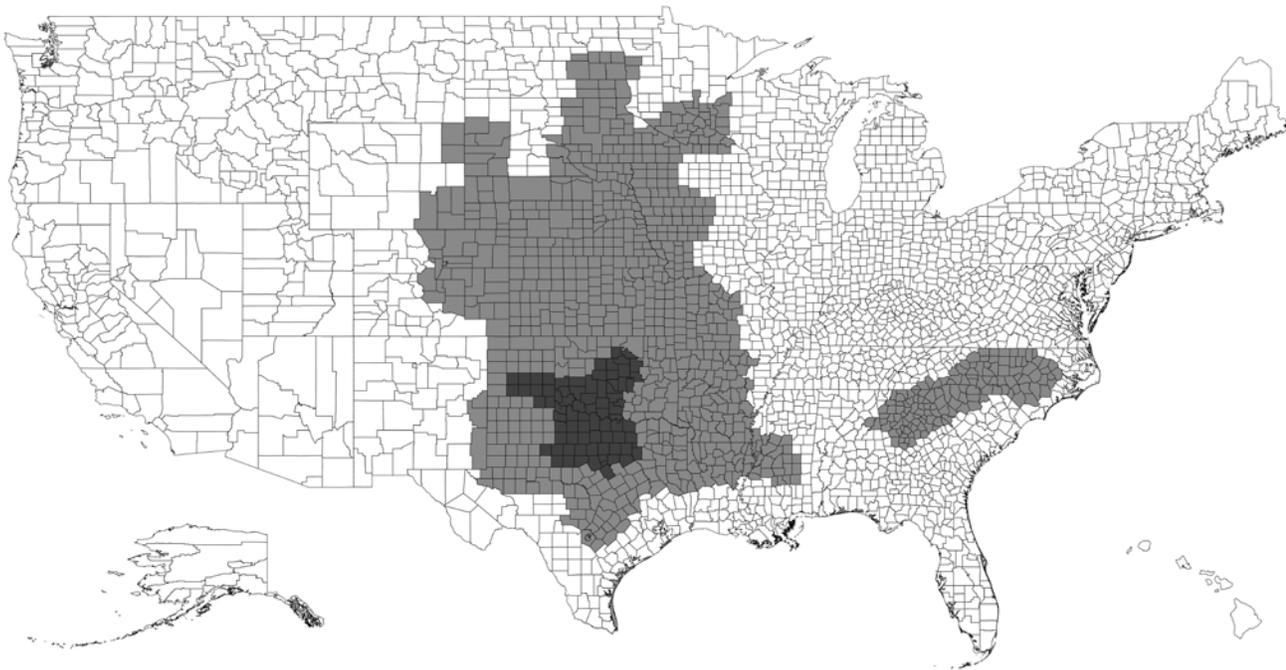


FIGURE 505.3.1
HAIL EXPOSURE MAP

Add new standard(s) as follows:

UL

2218-2010 Impact Resistance of Prepared Roof Covering Materials, with revisions through May 1, 2012

Reason: Section 101.3 of the *International Green Construction Code* (IgCC) states its intent “is to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative potential impacts and increase the positive potential impacts of the built environment on the natural environment and *building* occupants”. To provide for increased safety to occupants and minimize the negative impact of the built environment from hail requires buildings to be built to more than the minimum requirements of the *International Building Code* or the *International Residential Code*. To achieve this objective, A jurisdictional option for impact resistant roof coverings will help in achieving building material conservation. Use of more resilient materials adds to the longevity and durability of the building, which reduces the amount of materials in landfills.

A jurisdictional option is added to Table 302.1; a new section 505.3 is added; and, UL 2218 is added to Chapter 12.

New Figure 505.3 is from the 2009 edition of the IRC, Figure R903.5.

Cost Impact: Will increase the cost of construction. First cost would increase. In many cases, replacement costs can be avoided, netting a decrease in life cycle cost.

Analysis: A review of the standard proposed for inclusion in the code, UL 2218-10 (with revisions through May 1, 2012) with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG211-14 : 505.3 (NEW)-EUGENE554

GG212-14

202 (New), 505.1, 505.3 (New), 505.3.1 (New), 505.3.2 (New)

Proponent: Bill Griese (bgriese@tileusa.com); Alison Kinn-Bennett (kinn.alison@epa.gov); Don Horn (donald.horn@gsa.gov); Jessica Slomka (jslomka@nsf.org); Jane Rohde, Wess Sullens, Bill Freeman, Jeff Carrier and Don horn.

Add new definition as follows:

SECTION 202 DEFINITIONS

PROGRAM OPERATOR. Body or bodies that conduct a Type III environmental declaration program. A program operator can be a company or a group of companies, industrial sector or trade association, public authorities or agencies, or an independent scientific body or other organization.

TYPE III ENVIRONMENTAL PRODUCT DECLARATION. A product declaration that provides quantified environmental data using predetermined parameters and, where relevant, additional environmental information. For either brand-specific or industry-wide environmental product declaration.

Revise as follows:

505.1 Material selection and properties. Building materials shall conform to Section 505.2 or Section 505.3.

Exceptions:

1. Electrical, mechanical, plumbing, security and fire detection, and alarm equipment and controls, automatic fire sprinkler systems, elevators and conveying systems shall not be required to comply with Section 505.2.
2. Where a whole building life cycle assessment is performed in accordance with Section 303.1, compliance with Section 505.2 shall not be required.

Add new text as follows:

505.3 Multi-attribute material declaration and certification. Not less than 55 percent of the total building materials used in the project, based on mass, volume or cost, shall comply with Section 505.3.1 or 505.3.2. Where a material complies with both 505.3.1 and 505.3.2 the material value shall be multiplied by two.

505.3.1 Environmental Product Declaration. A building material with a *Type III environmental product declaration* that is verified by a *program operator*. The environmental product shall comply with the provisions of ISO 14025 and ISO 21930 externally.

505.3.2 Multi-attribute Standard. A material specific assessment that is verified by an *approved agency* shall be submitted for each product in accordance with the following items, as applicable. The assessment shall be verified as meeting the minimum performance level specified in each standard, which focuses on the life-cycle stages from development to end of life. These stages shall include material selection, energy and water use during development, performance, human and environmental impact, and end of life.

1. NSF/ANSI 140 for carpet
2. NSF/ANSI 332 for resilient floor coverings
3. NSF/ANSI 336 for commercial furnishings fabric
4. NSF/ANSI 342 for wall coverings
5. NSF/ANSI 347 for single ply roofing membranes
6. NSC 373 for natural dimension stone

7. TCNA ANSI/A138.1 or ceramic tiles, glass tiles, and tile installation materials
8. UL 100 for gypsum boards and panels
9. UL 102 for door leafs

Add new standard(s) as follows:

ISO:

ISO 14025 – 2006 Environmental labels and declarations – Type III environmental declarations – Principles and procedures

ISO 21930 – 2007 Sustainability in building construction – Environmental declaration of building products

NSF:

NSF/ANSI 140-2013 Sustainability Assessment for Carpet

NSF/ANSI 332-2012 Sustainability Assessment for Resilient Floor Coverings

NSF/ANSI 336-2011 Sustainability Assessment for Commercial Furnishings Fabric

NSF/ANSI 342-2012 Sustainability Assessment for Wall coverings

NSF/ANSI 347-2012 Sustainability Assessment for Single Ply Roofing Membranes

UL:

UL 100-2012 Sustainability for Gypsum Boards and Panels

UL 102-2012 Sustainability for Door Leafs

Natural Stone Council,

P.O. Box 539, Hollis, New Hampshire 03049

NSC 373-2013 Sustainability Assessment for Natural Dimension Stone

Tile Council of North America,

100 Clemson Research Boulevard, Anderson, SC 29625

TCNA ANSI/A138.1-2012 Standard Specification for Sustainable Ceramic Tiles, Glass Tiles, and Tile

Installation Materials

Reason:

Stopwaste.org (Alameda County, California):

The current section 505.2 is comprised of single attribute sustainability concepts (such as recycled content, regional, or bio-based). These single attribute environmental characteristics have benefits that are widely known and have been core components of worldwide codes, standards and green building programs to date. Specifically, the single attribute of "recycled-content" in materials is among the most valued and widely recognized environmental criteria for consumers and the construction industry. Therefore, single attribute indicators still have a large role to play in green building codes, standards, and programs, and are vital to include in future versions of IgCC.

The process of utilizing recycled content feedstock in new building materials nearly always results in reduced environmental impacts when compared to the use of virgin feedstock, though this is only part of the story. Using recycled-content as the primary indicator of sustainability - especially for interior products - is no longer adequate given the full life cycle of product production, manufacturing, and use.

During the manufacturing process, the impacts of materials harvesting and extraction can be reduced by making use of local, bio-based or recycled content products. However, other the components added during the manufacturing process may result in less preferable environmental outcomes, may compromise occupant health, or can dwarf the lifecycle savings of using some other feedstock. For example, using recycled tire flooring may be environmentally preferable because it is recycled, but when these products are used indoors, there may be exposure to odors and VOCs that make another non-recycled product preferable for the occupant type. Therefore, the need for more systematic evaluation of products that takes into account the multi-dimensional attributes of products is needed for the commercial building industry.

Multi-attribute sustainable product standards and environmental product declarations (EPDs) are a way to start accomplishing this. These two tools added as options of compliance will allow the most current thinking about material selection, multi-attribute assessments, and life-cycle transparency to be introduced to the code. The addition of EPDs and multi-attribute product standards will still allow the existing methodology to be utilized, but will also capture the momentum in the commercial green building market around product life-cycle impacts and supply chain transparency. In addition, adding these additional compliance options will allow for non-structural materials to play a greater role in green building recognition. We feel that these newer tools as options for compliance along with the traditional single attribute approach is a good transitional methodology towards the long-term goal of true multi-attribute product transparency and performance.

Resilient Floor Covering Institute (RFCI):

RFCI represents all of the major manufacturers of resilient floor covering that produce linoleum, vinyl, rubber and cork flooring. The IgCC has taken a major step forward in addressing the environmental impacts of buildings by introducing the International Green Construction Code. Since the code was introduced manufacturers of building materials, including resilient flooring, have made great strides in reducing the environmental impact of their products by analyzing the entire life cycle of these products.

Today there are standards available and being used to determine the environmental impacts of individual building materials. The changes being proposed as Section 505.3 *Multi-attribute material declaration and certification* which includes Environmental Product Declarations and Multi-attribute Standards reflect the type of standards being adopted by many environmental rating systems including the National Green Building Standard IgCC 700. These standards are either developed using a consensus-based process or developed in accordance with established ISO Standards. The inclusion of Section 505.3 in the IgCC requirements will enhance the standard in a very meaningful way by determining the environmental impacts of materials used in a building.

Because of the manner in which the programs proposed for Section 505.3 are certified it will not be difficult for the user of the IgCC standard including code officials to quickly determine if a building material meets the requirements of the proposed section.

RFCI strongly encourages the IgCC to adopt the proposed Section 505.3 as a positive step forward in making the International Green Construction Code a more meaningful standard in reducing the environmental impacts of the materials used in a building.

U.S. General Services Administration's Office of Federal High-Performance Green Buildings:

GSA's Office of Federal High-Performance Green Buildings supports the introduction of Environmental Product Declarations and multi-attribute environmental standards into the International Green Construction Code (IgCC). Material selection is an important part of creating high-performance green buildings that is not always given the attention that it deserves. The single attribute material requirements currently in the code have played an important role in transforming the construction materials market to include recycled content and biobased content, both of which are supported by federal procurement initiatives. Among its sustainability strategies, Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, seeks to foster markets for sustainable technologies and environmentally preferable materials, products, and services. The Order also encourages federal purchasing considerations to include products manufactured using processes that minimize greenhouse gas emissions. Multi-attribute standards are a logical tool to help move toward this goal. Environmental Product Declarations will encourage manufacturers to examine the impacts of their processes and can lead to informed decision-making for improvement. Adding these measures as a means of compliance for material selection in the IgCC is a positive step toward creating high-performance green buildings.

NSF International:

The current language in section 505.2 of the International Green Construction Code, version 2012, is comprised of the traditional single attribute approach (such as recycled content, regional, or bio-based) of addressing environmental requirements for material selections in codes and sustainable rating systems. Focusing on a single environmental attribute of a product inadvertently excludes important impacts and does not present a holistic perspective of the product's environmental footprint. In addition, a single attribute approach does not always recognize the highest environmental performance. It is an important next step to advance the standard by providing opportunities to recognize high performance building materials, including both structural and non-structural materials. Multi-attribute sustainable product standards and environmental product declarations (EPDs) are a way to accomplish this advancement. The addition of these two compliance paths provides a more innovative way of thinking about material selection. The multi-attribute sustainable product standards guarantee that a product meets a certain environmental performance across several areas of its life cycle. Additionally, EPDs are allowing manufacturers to transparently disclose the impact that products and their manufacturing have on the environment, which promotes more informed decision-making. The addition of these transparency tools, along with the traditional single attribute approach, is a good transitional methodology towards the long-term goal of true multi-attribute product transparency and performance.

JSR Associates, Inc.:

We support the inclusion of these new material selection pathways.

US Environmental Protection Agency (USEPA):

USEPA supports the proposal as it encourages multi-attribute, lifecycle-based approaches (via standards) and transparency (via EPDs). As the IgCC evolves, we would like to see 1) greater emphasis on multi-attribute environmental performance (rather than the other options) and 2) a focus on typically environmentally problematic product categories (rather than leaving it so open ended); however, we appreciate that this proposal is an important step in the right direction for environmental and human health protection.

Tile Council of North America (TCNA):

For over a decade, many manufacturers were promoting single environmental attributes (recycled content, regional materials, etc.) represented by different labels across different industries, all of which were important but resulted in an unorganized, confusing, and often misleading marketplace. As a result, many industries started to recognize the need to establish a lifecycle based multi-attribute approach to the assessment and specification of sustainable products, turning to broadly recognized lifecycle based international standards in the ISO 14000 series.

It is encouraging to report that a plethora of multi-attribute product sustainability assessment standards are available today for use by architects, specifiers, and consumers. These standards were developed in

accordance with the lifecycle based, multi-attribute framework specified by ISO 14024 and treat products similarly to the way that sustainable building rating systems treat buildings. While there are some differences in point systems, naming, and individual criteria, the standards have very similar impact assessment areas. Product criteria are defined by all of these standards within the key areas of sustainability: material usage, energy used to make the product, the manufacturing and operational programs that the manufacturer has in place, water usage, the impact on human health and the environment, end of life management, and product performance. Furthermore, more manufacturers today have released or are engaged in efforts to release EPDs. This allows manufacturers to transparently disclose the environmental impact of their products in a standardized reporting framework

When the IgCC was originally developed, the Chapter 5 working group strived to develop and embed similar multi-attribute and lifecycle based criteria within the Code. At the time, many of these industry specifications and EPD initiatives were still in development and not yet available for simple reference. However, since that time, progress has been made which has led to today's proposed revision that encompasses approximately 10 product industries and can be applicable to over 1,000 domestic manufacturers and many more worldwide. Similar to regular industry specifications for strength and performance referenced throughout the IBC, these industry specifications for sustainability would allow for IgCC product selection based on consensus criteria. Additionally, many of these standards and EPD criteria are already in use in our built environment. ICC 700-2012 references some of these standards, as does the most recent version of ASHRAE 189.1. Also, the US GSA and the California DGS utilize some of these standards in the purchasing requirements for products.

The time to begin including multi-attribute specifications and EPD criteria into the IgCC is now. These tools serve as a valuable strategy in achieving sustainable product optimization, are well-known throughout product industries, and are already incorporated or in the process of being incorporated into several other green building standards and rating systems. The proposed approach salvages original single-attribute criteria, which can still be utilized if needed, and incorporates a more up-to-date way of thinking about sustainable material selection which is consistent with the original intent of Chapter 5.

Carpet & Rug Institute (CRI):

Recognition and reliance upon multi-attribute standards is the most reliable and efficient means for a building operator, general contractor, or designer to recognize products with a full range of environmentally preferable characteristics. Rather than selecting components and finishes in a "piece meal" manner based upon single subjective attributes, multi-attribute standards provide the desired assurance of rigor, breadth, and depth. Further, the simplified identification process makes the selection and specification of these products much simpler and more likely to be employed.

While non-structural components such as interior finishes may be a small section of the total building impacts (in both volume and cost), their impacts should not be ignored and the efforts of manufacturers to produce the most preferable product possible should be recognized. Recognition of multi-attribute standards places the burden upon the manufacturer to concentrate upon total impacts of the product rather than picking and choosing a couple of "highlight" features.

For these reasons, we support the addition of 505.3 Multi-Attribute material declaration and certification as a pathway for achievement of this requirement.

Cost Impact: Will increase the cost of construction. This code change proposal *may* increase the cost of construction because of the cost involved in generating the EPD or complying with the multi-attribute standard for the building product manufacturer. However, EPDs and multi-attribute assessment frequently identify cost reduction measures that pay for the cost of the assessment and verification, and may not increase the cost of product production.

Analysis: A review of the standard proposed for inclusion in the code, ISO 14025:2006, 21930:2007, NSC 373-2013, 140-2013, 332-2012, 336-2011, 342-2012, 347-2012, TCNA A138.1-2012, UL 100-2012 and UL 102-2012 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG212-14 : 505.3 (New)-GITLIN185

GG213-14

505.2.2 (New), 506.1 (New), 506.2 (New), 506.2.1 (New), 506.3 (New), 506.3.1 (New), Section 506 (New)

Proponent: Robert Eugene, UL LLC, representing UL LLC (robert.eugene@ul.com)

Add new text as follows:

505.2.2 Used electrical equipment. Used electrical equipment exposed to water and not designed for such exposure shall not be permitted to be reused unless reconditioned in accordance with the manufacturer's specific instructions and recommendations.

SECTION 506 **USED ELECTRICAL EQUIPMENT**

506.1 Remanufactured electrical equipment. Remanufactured electrical equipment shall be listed and labeled in accordance with the safety standard for the equipment.

506.2 Used electrical equipment. Electrical equipment in good operating condition and with no visible defects shall be permitted to be reused within their ratings and intended usage subject to the approval of the code official.

506.2.1 Used electrical equipment exposure. Used electrical equipment exposed to fire, the heat or combustion by-products of fire or fire suppression or extinguishing media shall not be permitted to be reused unless reconditioned in accordance with the manufacturer's specific instructions and recommendations.

506.3 Retrofitted products. Electrical equipment that is retrofitted shall be listed and labeled in accordance with the most current safety standard for the equipment.

506.3.1 On-site retrofitting. Electrical equipment retrofitted on-site shall employ the supplied parts and installation method specified in the manufacturer's retrofit installation instructions.

Reason: To maintain an accepted level of safety, certain electrical products that are subjected to water or fire exposure should not be permitted to be reused. Any appliance or equipment that has been rebuilt, remanufactured, refurbished, repaired, or reconditioned should be subject to the same requirements for new materials that address quality, strength, effectiveness, fire resistance, durability and safety.

Cost Impact: Will increase the cost of construction. First cost may increase. Life cycle costs are likely to decrease.

GG213-14 : 506 (NEW)-EUGENE557

GG214-14

506.2, 506.3, 506.1, 506.1.1 (New), 506.1.2 (New), 506.1.3 (New)

Proponent: Jack Bailey, One Lux Studio, representing International Association of Lighting Designers (jbailey@oneluxstudio.com)

Revise as follows:

~~506.1 Low mercury lamps. The mercury content in lamps shall comply with Section 506.2 or 506.3.~~

~~**Exception:** Appliance, black light, bug, colored, germicidal, plant, shatter-resistant/shatterproof/shatter protected, showcase, UV, T-8 and T-12 lamps with a color rendering index of 87 or higher, lamps with RDC bases, and lamps used for special-needs lighting for individuals with exceptional needs.~~

The Mercury content in lamps shall comply with Sections 506.1.1, 506.1.2, and 506.1.3 as applicable.

Exception: Mercury content is not limited for lighting integral to equipment or instrumentation and installed by the manufacturer.

Add new text as follows:

506.1.1 Straight fluorescent lamps. Straight, double-ended fluorescent lamps less than 6 feet (1800 mm) in length shall comply with the following:

1. T-5 lamps with a rated lifetime less than 25,000 hours at 3 hours per start shall contain not more than 3 milligrams of Mercury per lamp.
2. T-8 lamps with a rated lifetime less than 25,000 hours at 3 hours per start shall contain not more than 4 milligrams of Mercury per lamp.
3. All others shall contain not more than 5 milligrams of Mercury per lamp.

506.1.2 Compact fluorescent lamps. Single-ended pin-base and screw-base compact fluorescent lamps shall contain not more than 5 milligrams of Mercury per lamp.

506.1.3 Circular fluorescent lamps. Circular fluorescent lamps shall contain not more than 5 milligrams of Mercury per lamp.

Delete without substitution:

~~**506.2 Straight fluorescent lamps.** Straight, double-ended fluorescent lamps less than 6 feet (1829 mm) in nominal length and with bi-pin bases shall contain not more than 5 milligrams of mercury per lamp.~~

~~**Exception:** Lamps with a rated lifetime greater than 22,000 hours at 3 hours per start operated on ANSI reference ballast shall not exceed 8 milligrams of mercury per lamp.~~

~~**506.3 Compact fluorescent lamps.** Single-ended pin-base and screw-base compact fluorescent lamps shall contain not more than 5 milligrams of mercury per lamp, and shall be listed and labeled in accordance with UL 1993.~~

~~**Exception:** Lamps rated at 25 watts or greater shall contain not more than 6 milligrams of mercury per lamp.~~

Reason: Mercury content requirements have been tightened based on improved market availability of low-mercury products. Exceptions for many specialized lamp types have been removed, because these are either older “legacy” products which do not need to be installed in new green buildings, or because they are “specialized” lamps which come installed in equipment.

Mercury content values are based on those in Oregon’s SB 1512.

Cost Impact: Will not increase the cost of construction.

GG214-14 : 506.1-BAILEY704

GG215-14

506.1, 506.2, 506.3

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Sustainability, Energy & High Performance Building Code Action Committee

Revise as follows:

506.1 ~~Low-Mercury content in fluorescent lamps.~~ The mercury content in straight fluorescent lamps shall comply with Section 506.1.1 and the mercury content in compact fluorescent lamps shall comply with Section 506.1.2-506.2 or 506.3.

Exception: Appliance, black light, bug, colored, germicidal, plant, shatter-resistant/shatterproof/shatterprotected, showcase, UV, T-8 and T-12 lamps with a color rendering index of 87 or higher, lamps with RDC bases, and lamps used for special-needs lighting for individuals with exceptional needs shall not be required to comply with Sections 506.1.1 or 506.1.2.

Revise as follows:

506.2-506.1.1 Straight fluorescent lamps. Straight, double-ended fluorescent lamps less than 6 feet (1829 mm) in nominal length and with bi-pin bases shall contain not more than 5 milligrams of mercury per lamp.

Exception: Lamps with a rated lifetime greater than 22,000 hours at 3 hours per start operated on an ANSI reference ballast shall not exceed 8 milligrams of mercury per lamp.

Revise as follows:

506.3-506.1.2 Compact fluorescent lamps. Single-ended pin-base and screw-base compact fluorescent lamps shall contain not more than 5 milligrams of mercury per lamp, and shall be listed and labeled in accordance with UL 1993.

Exception: Lamps rated at 25 watts or greater shall contain not more than 6 milligrams of mercury per lamp.

Reason: This proposal clarifies the fact that, at least currently, the provisions of Section 506 apply only to fluorescent lamps of the straight and compact varieties.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG215-14 : 506.1-THOMPSON319

GG 216-14

506.3

Proponent: Lisa Reiheld, Canadian Standards Association, representing Canadian Standards Association Group (lisa.reiheld@csagroup.org)

Revise as follows:

506.3 Compact fluorescent lamps. Single-ended pin-base and screw-base compact fluorescent lamps shall contain not more than 5 milligrams of mercury per lamp, and shall be listed and labeled in accordance with CSA C861 or UL 1993.

Exception: Lamps rated at 25 watts or greater shall contain not more than 6 milligrams of mercury per lamp.

Add new standard(s) as follows:

CSA C861-10 Performance of self-ballasted compact fluorescent lamps and ballasted adapters.

Reason: Addition of compliance to CSA C861 "Performance of self-ballasted compact fluorescent lamps and ballasted adapters" is standard equivalent to UL 1993 "Self-Ballasted Lamps and Lamp Adapters" currently referenced.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, CSA C861-10 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG216-14: 506.3-REIHELD1199

GG217-14

507.1, 507, 903.1

Proponent: Hope Medina, representing Colorado Chapter of ICC (hmedina@coloradocode.net);
Craig Conner, representing self (craig.conner@mac.com)

Delete without substitution:

~~SECTION 507 BUILDING ENVELOPE MOISTURE CONTROL~~

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
COMMISSIONING PLAN**

Chapter 5: Material Resource Conservation and Efficiency						
Moisture control (Section 507.1)						
1. Foundation sub-soil drainage system.	X	None	Field inspection and verification	Periodic inspection for entire sub-soil drainage system	None	507.1 and IBC Ch 18
2. Foundation waterproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
3. Foundation dampproofing	X	None	Field inspection and	Periodic inspection for the entire	None	507.1 and IBC Ch 18

Chapter 5: Material Resource Conservation and Efficiency						
			verification	foundation		
4. Under slab water vapor protection	X	None	Field inspection and verification	Periodic inspection for entire slab footprint	None	507.1, IBC Ch 19 and ASTM E 1643
5. Flashing at: exterior windows, doors, skylights, wall flashing and drainage systems	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of all flashing locations.	None	507.1 and IBC Ch 14
6. Exterior wall coverings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of exterior wall cladding systems.	None	507.1 and IBC Ch 14
7. Roof coverings, roof drainage, and flashings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of roof covering, roof drainage and flashings.	None	507.1 and IBC Ch 15

(Portions of table not shown remain unchanged.)

Reason: Section 507 has requirements in both the International Building Code and the International Energy Conservation Code. The 2015 IBC and IECC has the requirements laid out for any end user to be able to apply to the construction of their building. Section 507 in the IgCC has it in the laundry list form without any direction on what and how the requirements are to be carried out. Building envelope moisture control is a building durability issue not an above code issue.

Cost Impact: Will not increase the cost of construction.

GG217-14 : 507-MEDINA1076

GG218-14
507

Proponent: David Collins, The Preview Group, representing The American Institute of Architects (dcollins@preview-group.com)

Delete without substitution:

507
~~BUILDING ENVELOPE MOISTURE CONTROL~~

Reason: In the Chapter 9 Commissioning chapter, reference building envelope moisture management requirements in the IBC.

Cost Impact: Will not increase the cost of construction.

GG218-14 : 507.1-COLLINS388

GG219-14

507.1, 903.1

Proponent: Jason Wilen, representing National Roofing Contractors Association (NRCA)
(jwilen@nrca.net)

Revise as follows:

507.1 Moisture control preventative measures. Moisture preventative measures shall be inspected in accordance with Sections 902 and 903 for the categories listed in Items 1 through 7. Inspections shall be executed in a method and at a frequency as listed in Table 903.1.

1. Foundation sub-soil drainage system.
2. Foundation waterproofing.
3. Foundation dampproofing.
4. Under slab water vapor protection.
5. Flashings: Windows, exterior doors, skylights, wall flashing and drainage systems.
6. Exterior wall coverings.
7. Roof coverings, roof drainage, and flashings.
8. Lightweight structural concrete roof deck.

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 5: Material Resource Conservation and Efficiency						
Moisture control (Section 507.1)						
1. Foundation sub-soil drainage system.	X	None	Field inspection and verification	Periodic inspection for entire sub-soil drainage system	None	507.1 and IBC Ch 18
2. Foundation waterproofing	X	None	Field inspection	Periodic inspection for	None	507.1 and IBC Ch 18

			and verification	the entire foundation		
3. Foundation dampproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
4. Under slab water vapor protection	X	None	Field inspection and verification	Periodic inspection for entire slab footprint	None	507.1, IBC Ch 19 and ASTM E 1643
5. Flashing at: exterior windows, doors, skylights, wall flashing and drainage systems	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of all flashing locations.	None	507.1 and IBC Ch 14
6. Exterior wall coverings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of exterior wall cladding systems.	None	507.1 and IBC Ch 14
7. Roof coverings, roof drainage, and flashings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of roof covering, roof drainage and flashings.	None	507.1 and IBC Ch 15
8. <u>Lightweight structural concrete roof deck</u>	X	None	Field inspection and verification	<u>Prior to roof system installation to ensure a maximum 75 percent relative humidity of the roof deck or use of a vapor retarder between the roof deck and roof system.</u>	None	<u>507.1 and ASTM F2170</u>

(Portions of table not shown remain unchanged.)

Add new standard(s) as follows:

ASTM**F2170-11 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes**

Reason: This code change proposal is intended to add a requirement to the commissioning plan for the determination of relative humidity of a concrete roof deck prior to roof system installation when lightweight structural concrete is used as a roof deck. Problems including premature roof system failure can occur when a roof system is installed on a lightweight structural concrete deck that contains too much moisture at the time of roof system installation.

In support of this proposed code change, the document "*Moisture in Lightweight Structural Concrete Roof Decks: Concrete Moisture Presents Challenges for Roofing Contractors*," by the National Roofing Contractors Association (NRCA) can be viewed at

http://www.marksgraham.com/uploads/Moisture_in_Lightweight_Structural_Concrete_Roof_Decks--Aug.2013.pdf.

Cost Impact: Will increase the cost of construction. The cost increase could be avoided by use of a standard weight concrete roof deck.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F2170-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG219-14 : 507.1-WILEN850

GG220-14

507.1, 507.2 (New)

Proponent: Laverne Dalgleish, representing BEMMI (ldalgleish@airbarrier.org)

Revise as follows:

507.1 Moisture control preventative measures ~~measure inspections~~. Moisture preventative measures shall be inspected in accordance with Sections 902 and 903 for the categories listed in Items 1 through 7. Inspections shall be executed in a method and at a frequency as listed in Table 903.1.

1. Foundation sub-soil drainage system.
2. Foundation waterproofing.
3. Foundation dampproofing.
4. Under slab water vapor protection.
5. Flashings: Windows, exterior doors, skylights, wall flashing and drainage systems.
6. Exterior wall coverings.
7. Roof coverings, roof drainage, and flashings.

Add new text as follows:

507.2 Moisture Control Preventative Measures. Moisture control preventative measures shall be incorporated into the design of the building for each of the items listed in Section 507.1. For Item 6, a rainscreen wall shall be designed using one of the following methods:

1. System designed with minimum 1/4 inch airspace exterior to the water resistive barrier, vented to the exterior at the top and bottom of the wall, and integrated with flashing details, or
2. Water resistive barrier with enhanced drainage, meeting 75 percent drainage efficiency as determined in accordance with ASTM E2273, or
3. Rainscreen system design using materials that comply with ASTM WK-39491.

Add new standard(s) as follows:

ASTM E2273-03(2011) Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies

ASTM WK-39491 Specification for Manufactured Polymeric Drainage and Ventilation Materials used to Provide a Rainscreen Function

Reason: The greenest building there is, is the building you don't have to build. Having liquid water enter into the building envelope is a major cause to premature building envelope failure resulting in buildings being retrofitted or rebuilt. By having an air space, a high efficient water resistive barrier or a rainscreen wall, there will be less likely to be premature building envelope failure caused by liquid water.

Cost Impact: Will increase the cost of construction. Either of these measures will result in a small increase in labor and material costs

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2273-03(2011) and ASTM WK-39491 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG220-14 : 507.2-DALGLEISH1120

GG221-14

508 (New), 508.1 (New)

Proponent: Laura Bartels, GreenWeaver Inc., representing GreenWeaver Inc. ; David Eisenberg, Development Center for Appropriate Technology, representing Development Center for Appropriate Technology (strawnet@gmail.com); Dennis Murphy, representing USGBC California (dennis@usgbc-california.org); Megan Koehler (koehler@kmd-arch.com); Marjorie Smith, Siegel & Strain Architects, representing Siegel & Strain Architects (Msmith@siegelstrain.com); Suzanne Drake, Perkins+Will, representing Perkins+Will; Arlene Blum, representing Green Science Policy Institute; Vytenis Babrauskas, representing Fire Science and Technology Inc. (vytob@doctorfire.com); Bill Walsh, representing Healthy Building Network (bill@healthybuilding.net); Tony Stefani, representing San Francisco Firefighters Cancer Prevention Foundation (stefanit@sbcglobal.net); Richard Graves, International Living Future Institute, representing International Living Future Institute; Kirk Teske, representing HKS, Inc.

Add new text as follows:

SECTION 508 **INSULATION**

508.1 Disclosure. Manufacturers shall use one of the following methods to disclose the contents of insulation products to not less than 0.1 percent (1000 ppm):

1. A manufacturer's inventory that is published and publicly available that identifies all ingredients of the product by name and chemical abstract service registration number.

Exception: Materials defined as trade secret or intellectual property are permitted to withhold the name or chemical abstract service registration number where the role, amount and GreenScreen benchmark, as defined in GreenScreen v1.2, is disclosed.

2. The end use product has a published, complete Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration Open Standard.
3. The end product has been certified at the Cradle to Cradle v2 Basic Level or Cradle to Cradle v3 Bronze Level.
4. The end use product has a valid Declare label.
5. The end use product is fully disclosed in the Pharos Project Building Product Library.

Reason: From the 2012 IgCC:

101.5 Intent. This code is intended to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

In order to achieve the intent of the IgCC—to safeguard the environment, public health, safety and general welfare through requirements that reduce the negative and increase the positive impacts of the built environment—those impacts must be known and understood. That requires disclosure of the presence of all potentially harmful chemicals. This proposal is based on currently developed and accepted product and material disclosure protocols that require complete product content disclosure.

This disclosure requirement does not prohibit the use of any product or material. Rather, it requires disclosure of potentially harmful or hazardous chemicals or components to enable more fully informed decision-making on the part of designers, builders and building owners. The market is increasingly demanding information on the extent of products' lifecycle environmental and health impacts; from the acquisition of raw materials through production, distribution, use and ultimate disposal. A rapidly growing percentage of projects are requiring this information in specifications and project contracts.

Cost Impact: Will not increase the cost of construction

GG221-14 : 508 (NEW) #1-BARTELS420

GG222-14

508.1 (New), Section 508 (New)

Proponent: Laura Bartels, GreenWeaver Inc., representing GreenWeaver Inc.; Dennis Murphy, representing U.S. Green Building Council California (dennis@usgbc-california.org); Megan Koehler (koehler@kmd-arch.com); Marjorie Smith, Siegel & Strain Architects, representing Siegel & Strain Architects (Msmith@siegelstrain.com); Suzanne Drake, Perkins+Will, representing Perkins+Will; Arlene Blum, representing Green Science Policy Institute; David Eisenberg, Development Center for Appropriate Technology, representing Development Center for Appropriate Technology (strawnet@gmail.com); Vytenis Babrauskas, representing Fire Science and Technology Inc. (vytob@doctorfire.com); Bill Walsh, representing Healthy Building Network; Tony Stefani, representing San Francisco Firefighters Cancer Prevention Foundation (stefanit@sbcglobal.net); Bonnie Tabb, International Living Future Institute, representing International Living Future Institutue; Kirk Teske, HKS, Inc., representing HKS, Inc.

Add new text as follows:

SECTION 508 **INSULATION**

508.1 Surface-burning characteristics. Foam plastic insulation shall comply with Section 2603.3 of the International *Building Code*.

Exception: Rigid foam plastic insulation board shall not be subject to flame spread or smoke developed requirements where installed below a concrete slab on grade that provides continuous separation from the interior of the building, or installed as below-grade exterior foundation insulation, or installed in accordance with Section 1809.5 of the *International Building Code*. This foam plastic insulation shall be clearly labeled as such in addition to the requirements of Section 2603.2 of the International *Building Code*.

Reason: Where specific installations of foam plastic insulation pose no fire safety hazard in a building, there is no justification to require that insulation to meet flame spread and smoke developed criteria. The rigid foam plastic insulation in the applications delineated in this proposal present no fire risk. To the contrary, because specific chemicals as well as the general class of chemicals currently used to meet flame spread and smoke developed testing requirements in foam plastic insulation are known or suspected to pose human health and environmental risks, the current requirements increase a range of risks throughout the entire lifecycle of these materials while providing no fire safety benefit – which is the sole reason for requiring these fire performance criteria.

Flame spread and smoke developed requirements have led directly to the incorporation of halogenated flame retardant chemicals in all foam plastic insulation currently available in the U.S. Two key issues among the human and environmental health concerns related to these chemicals are the recognized negative health impacts to firefighters and emergency responders, and aquatic toxicity, which is a particular concern for these applications since the insulation is in contact with soil, and thus has a high likelihood of soil contamination. It is imperative to identify applications for which the use of these chemicals can be reduced or eliminated while maintaining fire safety.

This proposal neither requires changes in current practice nor precludes the use of flame-retarded foam insulation, but would allow manufacturers to meet the rapidly rising demand for foam plastic insulation without halogenated flame retardants. This is especially important for green building projects, which seek to meet stricter requirements for energy efficiency and human and ecological health, augmenting the traditional life-safety goals of the building codes. Growing awareness of the human and ecological health impacts of building materials is driving the rapid increase in market demand apparent in large and small architectural and engineering firms, their clients, home owners, and green building and product certification programs. This market demand for safer insulation is now blocked by current code provisions. This change would create the opportunity for more diversity in the market, encouraging the development and use of products that are safer for humans and the environment without any sacrifice in fire safety.

The labeling of rigid foam insulation to differentiate product lines is already widely done, as in the case of termite resistant and non-termite resistant foam. Any technical challenges to such labeling would be the responsibility of the manufacturers who choose to introduce foam insulation free of halogenated flame retardants.

This proposal represents a more complete risk assessment than current code as it incorporates a more accurate reflection of both actual fire risk and risks to public health, and fire fighter and emergency responders from the hundreds of tons of these persistent chemicals introduced into the environment every year. Halogenated flame retardants are hazardous or potentially hazardous chemicals which are known to be persistent organic pollutants and global contaminants. Current replacements for the most widely used and recognized chemicals of greatest concern are of the same general class of chemicals and thus are likely to present similar risks (Babrauskas et al.,

2012) .

Substantiation:

Because the code already accepts that 1 inch (25 mm) or greater of concrete or masonry protects foam plastic from ignition in the same way as a thermal barrier which meets the criteria of NFPA 275- by preventing the energy of a fire from reaching the foam, the separation provided by a concrete slab-on-grade or foundation more than adequately protects the insulation. Specifically, NFPA 275 states that after 15 minutes of a post-flashover fire, the temperature at the interface of the thermal barrier and foam cannot exceed 121°C average with 163°C at one peak value thermocouple. This is substantially below the auto-ignition temperature of plastic foams, which are in excess of 400°C for polystyrene and polyurethane (Babrauskas, 2003). As stated in the Commentary, concrete or masonry also has these characteristics.

There is no evidence or history of fires or fire risk associated with foam plastic insulation used below concrete slabs or for foundation insulation.

HBCD and TCPP are added to foam plastics to meet flame spread and smoke developed requirements. 90% percent of HBCD and 86% of TCPP produced is used for building insulation (EC, 2008; Env Can, 2012; US EPA, 2010). Both chemicals are now widespread global contaminants (Covaci et al., 2006; Marvin et al., 2011; Van der Veen & de Boer, 2012). The presence of flame retardant chemicals can significantly increase the toxicity of fires when materials burn (Stec & Hull, 2011). Materials with flame retardants can produce greater amounts of carbon monoxide, smoke, and soot, compared to non-flame retardant materials (Babrauskas, 1992; Purser, 2000; Schnipper, Smith-Hansen, & Thomsen, 1995; Wichman, 2003) . When HBCD burns, it produces dioxins, which are potentially carcinogenic (Birnbaum, Staskal, & Diliberto, 2003; Desmet, Schelfaut, & Sandra, 2005; Ebert & Bahadir, 2003). Firefighters have higher rates of cancers associated with dioxin exposure (IARC, 2010; LeMasters et al., 2006).

Canada and the European Union have scheduled HBCD to be phased out in the next 3-4 years (EC, 2011; Env Can, 2012). The US Environmental Protection Agency states that the chemical is

“...persistent in the environment, bioaccumulative in living organisms, and highly toxic to aquatic organisms.”

and

“Human exposure is evidenced by the presence of HBCD in breast milk, adipose tissue, and blood, and it biomagnifies in the food chain. HBCD presents human health concerns based on animal test results indicating potential reproductive, developmental, and neurological effects. People may be exposed to HBCD from products and dust in the home and workplace, as well as its presence in the environment.” (US EPA, 2012)

Less is known about TCPP but concerns include its persistence in the environment, human exposure, and the potential to cause cancer (Van der Veen & De Boer, 2012)Sweden uses the Eurocode classification system to rate the combustibility of building components including foam plastic insulation. Foam plastics are classified as combustible, and thus building codes specify how these materials can be used in fire safe ways, such as behind thermal barriers, concrete or masonry, and with other construction techniques (Blomqvist et al., 2011; Lassen et al., 2011; POPRC, 2011; Posner et al., 2010). Since non-flame retardant foam plastics have been used in Sweden, building fires and deaths from building fires have not increased, indicating that fire safety is maintained by the code mandated measures (Harrami & McIntyre, 2006; Lundqvist et al., 2008; Remberger et al., 2004).

From the 2012 IBC code and commentary:

2603.4.1.1 Masonry or concrete construction. A thermal barrier is not required for foam plastic installed in a masonry or concrete wall, floor or roof system where the foam plastic insulation is covered on each face by a minimum of 1-inch (25 mm) thickness of masonry or concrete.

Commentary No thermal barrier is required when 1 inch (25 mm) or more of masonry or concrete is placed between the foam plastic and interior of the building. The intent is to accept 1 inch (25 mm) of masonry or concrete as equal to (or better than) 1/2- inch (12.7 mm) gypsum wallboard. This condition can arise when foam plastics are installed either within a wall or on the exterior side of a masonry wall. Some common examples are when foam plastics are installed:

- In the cavity of a hollow masonry wall;
- As the core of a concrete-faced panel;
- On the exterior face of a masonry wall and covered with an exterior finish;
- Within the cores of hollow masonry units; or
- Encapsulated within a minimum of 1-inch (25 mm) concrete or masonry wall, floor or roof system, such as in insulated tilt-up or pour-in-place concrete panels.

Note that the exterior surface would be required to comply with Section 2603.5. From the 2012 IgCC:

101.5 Intent. This code is intended to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

And from the 2012 IBC code and commentary:

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

Commentary: The intent of the code is to set forth regulations that establish the minimum acceptable level to safeguard public health, safety and welfare and to provide protection for fire fighters and emergency responders in building emergencies. The intent becomes important in the application of such sections as Sections 102, 104.11 and 114 as well as any enforcement-oriented interpretive action or judgment. Like any code, the written text is subject to interpretation. Interpretations should not be affected by economics or the potential impact on any party. The only considerations should be protection of public health, safety and welfare and emergency responder safety.

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Links to the above research reports, and other supporting documentation are available for viewing and download at: <http://saferinsulation.org/bibliography/>.

Cost Impact: Will not increase the cost of construction.

GG222-14 : 508 (NEW) #2-BARTELS640

GG223-14

Section 508 (New), 508.1 (New), Section 202 (New)

Proponent: Matthew Dobson, Vinyl Siding Institute, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

Add new definition as follows:

SECTION 202 DEFINITIONS

FINISH BUILDING AREA. Total square foot area of exterior walls, floors, and ceilings and interior walls, floors, and ceilings.

Add new text as follows:

SECTION 508 DURABLE FINISHES

508.1 Minimum area. Not less than 55 percent of the total finish building area shall consist of materials or assemblies that do not require site-applied finishing or re-occurring finishing as a part of the maintenance process. Qualifying materials or assemblies shall exhibit a minimum finish life expectancy of 25 years.

Reason: This addition brings in a durability aspect to the code which is sorely missing. By requiring prefinished durable products both short and long term impacts on the environment are reduced. This concept is currently used in the National Green Building Standard and California Green Buildings Standards Code.

Cost Impact: Will not increase the cost of construction. Although it's hard to quantify the cost impact of this requirement depending on the material application, short term costs may vary, however long term maintenance costs could potentially go down with this change.

GG223-14 : 508 (NEW)-DOBSON973

GG224-14

A105.4, A105.4.1

Proponent: Martha VanGeem, representing self (martha.vangeem@gmail.com)

Add new text as follows:

SECTION 508 BUILDING SERVICE LIFE PLAN

Revise as follows:

~~A105.4-508.1 Building service life plan project electives.~~ Projects seeking a building service life plan project elective shall comply with this section. The A building service life plan (BSLP) in accordance with Section 508.1.1 ~~A105.4.1~~ shall be included in the construction documents.

~~A105.4.1-508.1.1 Plan and components.~~ The building service life plan (BSLP) shall indicate the intended length in years of the design service life for the building as determined by the building owner or *registered design professional*, and shall include a maintenance, repair, and replacement schedule for each of the following components. The maintenance, repair and replacement schedule shall be based on manufacturer's reference service life data or other *approved* sources for the building components. The manufacturer's reference service life data or data from other *approved* sources shall be included in the documentation.

1. Structural elements and concealed materials and assemblies.
2. Material and assemblies where replacement is cost prohibitive or impractical.
3. Major materials and assemblies that is replaceable.
4. Roof coverings.
5. Mechanical, electrical and plumbing equipment and systems.
6. Site hardscape.

Reason: This proposal moves the Building Service Life Plan (BSLP) from project electives to a mandatory section in Chapter 5.

Building Service Life Planning (BSLP) is an important aspect of green building. It documents that life cycle thinking was used in the design process. It should be included as a mandatory requirement of the IgCC.

BSLP is not a new concept although the term may be unfamiliar. In new construction, most building owners examine initial costs and return on investment when considering a building project. In existing construction, most building owners evaluate the purchase of a new product in terms of the life cycle costs of the product relative to the length of time they expect to own the building. At a very fundamental level, that is Building Service Life Planning (BSLP).

BSLP involves consideration of the likely performance of the building under likely conditions over the whole of its life. BSLP is especially important for buildings designed and constructed to the IgCC because certain IgCC requirements may limit the kinds of materials or treatments that may be used for or applied to components.

BSLP practices have been refined over many years. The most comprehensive protocols for BSLP have been developed through ISO. ISO TC 59/SC14 on Design Life of Buildings has published/updated 10 standards on the topic.

[ISO 15686-1:2011](#) Buildings and constructed assets -- Service life planning -- Part 1: General principles and framework

[ISO 15686-2:2001](#) Buildings and constructed assets -- Service life planning -- Part 2: Service life prediction procedures

[ISO 15686-3:2002](#) Buildings and constructed assets -- Service life planning -- Part 3: Performance audits and reviews

[ISO 15686-5:2008](#) Buildings and constructed assets -- Service-life planning -- Part 5: Life-cycle costing

[ISO 15686-6:2004](#) Buildings and constructed assets -- Service life planning -- Part 6: Procedures for considering environmental impacts

[ISO 15686-7:2006](#) Buildings and constructed assets -- Service life planning -- Part 7: Performance evaluation for feedback of service life data from practice

[ISO 15686-8:2008](#) Buildings and constructed assets -- Service-life planning -- Part 8: Reference service life and service-life estimation

[ISO/TS 15686-9:2008](#) Buildings and constructed assets -- Service-life planning -- Part 9: Guidance on assessment of service-life data

[ISO 15686-10:2010](#) Buildings and constructed assets -- Service life planning -- Part

10: When to assess functional performance

Various other standards organizations have documents on the topic as well. The service life plan is similar in concept to Canadian Standards Associations (CSA) Standard S478, *Guideline on Durability for Buildings*, and ASHRAE 189.1 Section 10.3.2.3. Other organizations including BSI, BRE, and CEN also have documents on service life.

Cost Impact: Will increase the cost of construction.

GG224-14 : 508-VANGEEM995

GG225-14
202 (New), 302.1, 508.1 (New)

Proponent: Tom Marks, Stego Industries LLC, representing Stego Industries, LLC; Ryan Goodwin (ryangoodwin@stegoindustries.com)

Add new definition as follows:

SECTION 202
DEFINITIONS

CONTINUOUS PHYSICAL FOUNDATION TERMITE BARRIER. An uninterrupted, non-chemical method of preventing ground termite infestation such as, but not limited to, aggregate barriers, stainless steel mesh, flashing, or plastic barriers.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY			
503.1	Minimum percentage of waste material diverted from landfills	<input type="checkbox"/> 50% <input type="checkbox"/> 65% <input type="checkbox"/> 75%	
<u>508.1</u>	<u>Termite barrier</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

Add new text as follows:

SECTION 508
TERMITE BARRIER

508.1 Termite barrier. Where this section is indicated to be applicable in Table 302.1, an approved continuous physical foundation termite barrier used with low toxicity treatment or without chemical treatment shall be installed in geographical areas that have subterranean termite infestation potential.

Add new standard(s) as follows:

ICC 700 National Green Building Standard (NGBS) 2012 - Section 602.1.5 Termite Barrier

LEED BD+C: Homes v4 - Sustainable Sites Credit 3 Nontoxic pest control

Reason: Each year subterranean termites cause billions of dollars in damage to homes and buildings throughout the United States. Although termite protection has been associated mostly with residential construction, commercial buildings are also susceptible to termite damage, especially in areas that are more prone to termite infestation. If not mitigated, termites will eat away at building materials which has the potential to cause serious structural damage and negatively affect the durability of the building and components.

Non-toxic, physical barriers for termites are already referenced in the NGBS and LEED v4 Homes Rating System. Thus, these non-chemical alternatives for preventing termite infestation are already identified within the industry as a more sustainable and safer means of constructing buildings, while also maintaining high levels of building performance.

This comment is meant to be included as a jurisdictional requirement to the IgCC. Some areas of the country are much more prone to termite infestation than others (see map below). Thus, individual jurisdictions should make the decision on whether termite control is necessary and if physical termite protection is an appropriate option.



Cost Impact:
construction

Will increase the cost of

GG225-14 : A105.8 (NEW)-MARKS633

GG226-14

802.3

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing SEHPCAC

Delete and substitute as follows:

~~**802.3 Air-handling system filters.** Filter racks shall be designed to prevent airflow from bypassing filters. Access doors and panels provided for filter replacement shall be fitted with flexible seals to provide an effective seal between the doors and panels and the mating filter rack surfaces. Special tools shall not be required for opening access doors and panels. Filter access panels and doors shall not be obstructed.~~

802.3 Bypass pathways. Air handling equipment and HVAC equipment shall be designed and installed to limit the amount of airflow that bypasses the air filters. Channels, racks and other filter holding constructions that do not seal tightly to the filter frame by means of a friction fit shall provide a means to seal the filter frame to the filter holding construction. Where standard size filters are installed in banks of multiple filters, gaskets shall seal the gap between the frames of adjacent filters. As an alternative to gaskets, the frames of adjacent filters shall be compressed tightly together by means of spring elements that are built into the filter holding construction. Channels, racks and other filter holding constructions shall be sealed to the duct or housing of the HVAC equipment served by the filters. Filter access doors in ducts and HVAC equipment shall be designed to limit the amount of airflow that bypasses the filters. Field or shop fabricated spacers shall not be installed for the purpose of replacing the intended size filter with a smaller size filter. Gaskets and seals shall be accessible for repair, maintenance and replacement.

Reason: ASHRAE 189.1 has Section 8.3.1.3 c that addresses filter bypass. The IgCC address this important concern under Section 802.3. Text very similar to this proposed text was recently approved for 189.1 to clarify the intent. This proposed language updates the IgCC language to address concerns that were addressed by ASHRAE, but not IgCC, such as filters installed in banks (the third sentence in the proposal). High efficiency filters prevent air from flowing around the filters instead of through them. Bypass leakage can be substantial if the filters are not tightly sealed in the framework that holds them. Often installers fashion a sheet metal spacer to block off part of the filter holding construction area so as to allow a smaller filter to be installed because the correct filters may not be on hand or convenient. This practice increases the flow velocity through the filters, causes flow resistance and turbulence and results in a loss of efficiency of the air handler and the filters. Any gaskets used to seal filters must be resilient enough to consistently create a seal as filters are changed over the life of the system.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG226-14 : 802.3-THOMPSON354

GG227-14

803.1.1, 1003.2.2

Proponent: Charles Withers, representing The National Board (cwithers@nationalboard.org)

Revise as follows:

803.1.1 Duct openings. Duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or shall be closed by an *approved* method to reduce the amount of dust and debris that collects in the system from the time of rough-in installation and until startup of the heating and cooling equipment. Dust and debris shall be cleaned from duct openings prior to system flush out, startup and building occupancy.

1003.2.2 Heating, ventilating and air-conditioning. Heating, ventilating and air-conditioning systems and equipment shall be in accordance with the following:

1. Time clock and automatic time switch controls that can turn systems off and on according to building occupancy requirements shall be provided and connected to the following HVAC equipment: chillers and other space-cooling equipment, chilled water pumps, boilers and other space-heating devices, hot water pumps, heat exchanger circulation pumps, supply fans, return fans, and exhaust fans. Where occupant override is provided, it shall be designed with a timer to automatically revert to time clock and automatic time switch controls in not longer than 12 hours.

Exception: A time clock or automatic time switch controls shall not be required for spaces where any of the following conditions exist:

1. A time clock is not required by Section C403.2.4.3 of the *International Energy Conservation Code*.
 2. There is 24-hour occupancy materials with special atmospheric requirements dependent on 24-hour space conditioning.
 3. A majority of the areas of the building served by the system are under setback thermostat control.
 4. Manufacturer's specifications stipulate that the system must not be shut off.
2. Functional outside air economizers shall be provided on all cooling systems of more than $4\frac{1}{2}$ tons total cooling capability, 54,000 Btu/h, or more than 1800 cfm ($9.144 \text{ m}^3/\text{s} @ \text{m}^2$) air flow, provided manufacturer's guidelines are available for adding the economizer to the existing system.

Exception: An outside air economizer shall not be required for buildings or special uses where 100 percent outside air for ventilation is required or where any of the following conditions exist:

1. Section C403.3.1 of the *International Energy Conservation Code* would not require an economizer.
2. The existing system has a water-based economizer.
3. The existing system does not have an outside air intake.
4. Special economizer operations such as, but not limited to, carefully controlled humidity would require more energy use than is conserved.
5. There is insufficient space to install necessary equipment.
6. Installation of an economizer would require major modifications to the building's life safety system.
7. The existing system is a multi-zone system where the same intake air is used at the same time for either heating or cooling in different parts of the building.

3. HVAC piping and ducts, including those located above suspended ceilings, shall comply with Sections 606.3 and 606.4.

Exceptions: Additional insulation shall not be required for piping where any of the following conditions exist:

1. Additional insulation shall not be required for piping where any of the following conditions exist:
 - 1.1. It is located within HVAC equipment;
 - 1.2. It is located within conditioned space that conveys fluids between 60°F (15.6°C) and 105°F (40.6°C);
 - 1.3. Piping that is already insulated and the insulation is in good condition; or
2. Where HVAC ducts and piping are installed in a building cavity or interstitial framing space of insufficient width to accommodate the duct or pipe and the insulation required by Section 606.3 and Table 606.4, the insulation thickness shall be permitted to have the maximum thickness that the wall can accommodate, but shall not be less than $\frac{1}{2}$ -inch (12.7 mm) thick.
4. Where central heat is intended to be replaced with individual electric space heaters, the application for the electrical permit shall include documentation demonstrating that the new electric heaters will not consume more energy than the existing nonelectric heaters.
5. Boiler systems shall have been cleaned and tuned within one year prior to the alteration. Boilers shall be equipped with an outdoor air lock-out thermostat or a temperature reset control.
6. Boilers shall comply with the control and safety device requirements of the International Mechanical Code.
7. Chillers shall be equipped with an outdoor air lockout thermostat and chilled water reset control.
8. A maximum 5-year phase out plan shall be provided for buildings with existing systems that use CFC-based refrigerants.
9. Where mechanical and electrical systems and equipment are joined with microprocessors that communicate with each other or to a computer, a properly integrated building automation system shall be installed to optimize energy, operations, and indoor comfort. The building automation system shall:
 - 9.1. Allow the owner to set up schedules of operation for the equipment and provide equipment optimal start with adaptive learning;
 - 9.2. Provide trim and respond capabilities based on zone demand;
 - 9.3. Offer the ability to monitor energy usage, including the ability to meter electric, gas, water, steam, hot water, chilled water, and fuel oil services;
 - 9.4. Offer economizing based on enthalpy calculation and/or CO₂ set point control;
 - 9.5. Offer load shedding when power companies are at peak demand and need; and
 - 9.6. Offer the ability to send alarms to alert building owner, manager, or operator when problems occur due to system failures.

Reason: Proposed changes will clarify requirements and add understanding for better efficiency and safety.

Cost Impact: Will not increase the cost of construction

GG227-14 : 803.1.1-WITHERS1019

GG228-14

803.3

Proponent: Hope Medina, representing Cherry Hills Village (hmedina@coloradocode.net)

Delete without substitution:

~~**803.3 Environmental tobacco smoke control.** Smoking shall not be allowed inside of buildings. Any exterior designated smoking areas shall be located not less than 25 ft (7.5 m) away from building entrances, outdoor air intakes, and operable windows.~~

Reason: The IgCC will have commercial buildings with R occupancies involved. How is this requirement being enforced in situations where a resident who owns a condo in a four story building chooses to smoke in their own home? Most code officials do not have any enforceable power to regulate these provisions in any situation whether an R occupancy is involved or not. Federal buildings have smoking regulations, and many states and local jurisdictions now have regulations on where smoking is permitted outside of commercial buildings. This should be left to them to regulate.

Cost Impact: Will not increase the cost of construction.

GG228-14 : 803.3-MEDINA1175

GG229-14

803.4

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing SEHPCAC

Revise as follows:

803.4 Isolation of pollutant sources. The isolation of pollutant sources related to print, copy and janitorial rooms, ~~garages and hangars~~ shall be in accordance with Section 803.4.1.

Reason: Section 803.4 refers to Section 803.4.1 for requirements related to “garages and hangars.” There are no requirements, however, for garages and hangars in Section 803.4.1. This language is a remnant from past editions of the code and is no longer relevant.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG229-14 : 803.4-THOMPSON353

GG230-14

804.1, 804.1.1

Proponent: Don Denton, representing self (ventfree@comcast.net)

Revise as follows:

804.1 Fireplaces and appliances. Where located within buildings, fireplaces, and solid fuel-burning appliances, ~~vented decorative gas~~ appliances, vented gas fireplace heaters and decorative gas appliances for installation in fireplaces shall comply with Sections 804.1.1 through 804.1.3. ~~Unvented room heaters and unvented decorative~~ appliances, including alcohol burning, shall be prohibited.

804.1.1 Venting and combustion air. Fireplaces and solid fuel-burning appliances ~~shall be vented to the outdoors and~~ shall be provided with combustion air provided from the outdoors in accordance with the International *Mechanical Code* and the International *Fuel Gas Code*. Solid-fuel-burning fireplaces shall be provided with a means to tightly close off the chimney flue and combustion air openings when the fireplace is not in use.

Reason: Acceptance of this code change proposal would eliminate the requirement for all gas appliances to be vented to the outdoors, and it would allow unvented room heaters and unvented decorative appliances. Once the text is changed to allow unvented gas appliances, the text of the remaining subsections deals only with solid-fuel appliances and fireplaces. Section 804.1.1 disallowed unvented appliances by requiring all appliances to be vented to the outdoors, but as revised, unvented appliances would be allowed and all other types of gas-fired appliances would still be required to be vented by the IFGC. It is unnecessary for the IgCC to require appliances to be vented because that is already required by the IMC and IFGC. The IFGC allows unvented appliances that comply with ANSI Z21.11.2. As revised, the IgCC text will require that fireplaces and solid fuel appliances be efficient and minimize building air infiltration, consistent with the original intent.

Unvented room heaters and unvented decorative appliances are listed to the same stringent national product standard, ANSI Z21.11.2. Two primary criteria exist for these products to be considered green: first, their energy efficiency, and second, their impact on indoor air quality.

When considered from a site or point-of-use standpoint, unvented room heaters and invented decorative appliances are more energy efficient than any gas, wood or biomass appliance allowed by the IgCC. When considered from a source or fuel origination standpoint, unvented room heaters and unvented decorative appliances are more energy efficient than any electric appliance allowed by the IgCC. The code should not disallow the most energy efficient supplemental heating products available to architects, contractors, and homeowners.

Unvented room heaters and unvented decorative appliances meet nationally recognized indoor air quality guidelines of the federal government. Compliance of these supplemental heating products with the national guidelines has been repeatedly confirmed by peer-reviewed research of Gas Research Institute, American Gas Association Research, and the renowned Arthur D. Little; by Risksciences, a toxicology firm; and, by Wilson Environmental, an indoor air quality firm.

Unvented heaters and unvented decorative appliances are green in considering the key criteria of energy efficiency and indoor air quality. They clearly merit inclusion in the IgCC.

Cost Impact: Will not increase the cost of construction. Unvented gas heating products not only provide users and installers with lower cost of purchase and installation, but also reduced utility bills resulting from energy savings.

GG230-14 : 804.1-DENTON726

GG231-14

804.1, 804.1.1

Proponent: Bruce Swiecicki, representing National Propane Gas Association
(bswiewicki@npga.org)

Revise as follows:

804.1 Fireplaces and appliances. Where located within buildings, fireplaces, solid fuel-burning appliances, vented decorative gas appliances, vented gas fireplace heaters and decorative gas appliances for installation in fireplaces shall comply with the *International Mechanical Code*, the *International Fuel Gas Code* and Sections 804.1.1 through 804.1.3. ~~Unvented room heaters and unvented decorative appliances, including alcohol burning, shall be prohibited.~~

804.1.1 Venting and combustion air. Fireplaces and solid fuel-burning appliances ~~shall be vented to the outdoors and~~ shall be provided with combustion air provided from the outdoors in accordance with the *International Mechanical Code* ~~and the *International Fuel Gas Code*.~~ Solid fuel burning Fireplaces shall be provided with a means to tightly close off the chimney flue and combustion air openings when the fireplace is not in use.

Reason: Unvented gas heaters include both room heaters and several types of hearth products--all listed to the same stringent ANSI safety performance standard, Z21.11.2. Two primary criteria exist for these products to be considered green: first, their energy efficiency performance and second, their impact on indoor air quality.

When considered from a site or point-of-use standpoint, unvented heaters and hearth products are more energy efficient than any gas, wood or biomass appliance allowed by the IgCC. When considered from a "source energy" standpoint, unvented heaters and hearth products are more energy efficient than any electric appliance allowed by the IgCC. The code should not disallow the most energy efficient heating appliance available to architects, contractors, and owners.

Unvented heaters and hearth products meet nationally recognized indoor air quality guidelines of the federal government. Compliance of these products with the national guidelines has been repeatedly confirmed by peer-reviewed research such as that performed by the University of Illinois.

Unvented heaters and hearth products are green from the code's key criteria of energy efficiency and indoor air quality. They clearly should not be excluded for use by the IGCC.

The proposed change to 804.1.1 is needed because the definition of "FIREPLACE" in Chapter 2 is limited to solid-fuel burning equipment. There is no need for the modifier "solid fuel burning" because it begs the question of what other types of fireplaces there may be.

Bibliography:

Final Report on Combustion Product Concentrations of Unvented Gas Fireplaces
Jeffrey R. Gordon Paul W. Francisco William B. Rose 2008

Cost Impact: Will not increase the cost of construction.

GG231-14 : 804.1-SWIECICKI1089

GG232-14

804.1.3

Proponent: Lisa Reiheld, representing CSA Group (lisa.reiheld@csagroup.org)

Revise as follows:

804.1.3 Biomass appliances. Biomass fireplaces, stoves and inserts shall be listed and labeled in accordance with ASTM E 1509, CSA B415.1 or UL 1482. Biomass furnaces shall be listed and labeled in accordance with CSA B366.1 or UL 391. Biomass boilers shall be listed and labeled in accordance with CSA B366.1 or UL 2523.

Add new standard(s) as follows:

CSA

CSA B415.1 Performance testing of solid- fuel burning heating appliances

Reason: This adds a reference to CSA B415.1 "Performance testing of solid-fuel burning heating appliances" which is equivalent standard to ASTM E1509 and UL 1482.

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, CSA B415.1-10 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG232-14 : 804.1.3-REIHELD1217

GG233-14

804.2

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

804.2 Post-construction, pre-occupancy baseline IAQ testing. Where this section is indicated to be applicable in Table 302.1, and after all interior finishes are installed, the building shall be tested for indoor air quality and the testing results shall indicate that the levels of VOCs meet the levels detailed in Table 804.2 using testing protocols in accordance with ASTM D 6196, ASTM D 5466, ASTM D 5197, ASTM D 6345, and ISO 7708. Test samples shall be taken in not less than one location in each 25,000 square feet (1860 m²) of floor area or in each contiguous floor area.

Exceptions:

1. Group F, H, I-2, S and U occupancies shall not be required to comply with this section.
2. A building shall not be required to be tested where a similarly designed and constructed building as determined by the *code official*, for the same owner or tenant, has been tested for indoor air quality and the testing results indicate that the level of VOCs meet the levels detailed in Table 804.2.
3. Where the building indoor environment does not meet the concentration limits in Table 804.2 and the tenant does not address the air quality issue by mitigation and retesting, the building shall be flushed-out by supplying continuous ventilation with all air-handling units at their maximum outdoor air rate for at least 14 days while maintaining an internal temperature of at least 60°F (15.6°C), and relative humidity not higher than 60 percent. Occupancy shall be permitted to start 7 days after start of the flush-out, provided that the flush-out continues for the full 14 days.

Reason: In an acute health care setting, indoor air quality is addressed by a more rigorous clinical standard, typically ASHRAE 170. State licensure rules typically require a much higher ventilation rate in hospital, in some rooms as much as 20 air changes per hour. These systems are required to go through a commissioning process and are fully operational for extended periods as a facility trains staff, stocks the facility and prepares for seeing patients. Healthcare facilities undergo a significant amount of renovation on a regular basis. As written this test could be applied to every small renovation, diagnostic equipment change or minor improvement. This would have significant cost impact on these facilities.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG233-14 : 804.2-PAARLBERG659

GG 234-14

804.2

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Chair, Sustainability, Energy and High Performance Code Action Committee (SEHPCAC) (SEHPCAC@iccsafe.org)

Revise as follows:

804.2 Post-construction, pre-occupancy baseline IAQ testing. Where this section is indicated to be applicable in Table 302.1, and after all interior finishes are installed, the building shall be tested for indoor air quality. ~~and~~ The testing results shall indicate that the summed concentration of all of the individual volatile organic compounds, also known as total volatile organic compounds, including tentatively identified compounds, expressed as a toluene equivalent value using testing protocols in accordance with ASTM Methods D 6196, D 5466, or other approved methods, do not exceed 500 micrograms per cubic meter of air above outdoor concentrations. Where detected in the indoor total volatile organic compound samples, the concentrations for the individual volatile organic compounds shall not exceed the amounts indicated in Table 804.2, after correction for outdoor levels. Formaldehyde shall be tested using testing protocols in accordance with ASTM Method D 5197, or other approved methods. The formaldehyde levels shall not exceed 27 parts per billion above outdoor concentrations. ~~levels of VOCs meet the levels detailed in Table 804.2 using testing protocols in accordance with ASTM D 6196, ASTM D 5466, ASTM D 5197, ASTM D6345, and ISO 7708.~~ Test samples shall be taken in not less than one location in each 25,000 square feet (1860 m2) of floor area or in each contiguous floor area. Test samples shall be taken in not less than two outdoor areas near outdoor air intakes. Test samples shall be collected over a time period of not less than 4 hours.

Exceptions:

1. Group F, H, S and U occupancies shall not be required to comply with this section.
2. A building shall not be required to be tested where a similarly designed and constructed building as determined by the *code official*, for the same owner or tenant, has been tested for indoor air quality and the testing results indicate that the level of VOCs meet the levels detailed in Table 804.2.
3. Where the building indoor environment does not meet the concentration limits in Table 804.2 and the tenant does not address the air quality issue by mitigation and retesting, the building shall be flushed-out by supplying continuous ventilation with all air-handling units at their maximum outdoor air rate for at least 14 days while maintaining an internal temperature of at least 60°F (15.6°C), and relative humidity not higher than 60 percent. Occupancy shall be permitted to start 7 days after start of the flush-out, provided that the flush-out continues for the full 14 days.

**TABLE 804.2
MAXIMUM CONCENTRATION OF INDOOR AIR POLLUTANTS^b**

MAXIMUM CONCENTRATION OF AIR POLLUTANTS RELEVANT TO IAQ	MAXIMUM CONCENTRATION, ug/m ³ . (unless otherwise noted)
1-Methyl-2-pyrrolidinone ^a	160
1,1,1-Trichloroethane	1000
1,3-Butadiene	20

1,4-Dichlorobenzene	800
1,4-Dioxane	3000
2-Ethylhexanoic acid ^a	25
2-Propanol	7000
4-Phenylcyclohexene (4- PCH) ^a	2.5
Acetaldehyde	140
Acrylonitrile	5
Benzene	60
t-Butyl methyl ether	8000
Caprolactam ^a	100
Carbon disulfide	800
Carbon monoxide	9 ppm and no greater than 2 ppm above outdoor levels
Carbon tetrachloride	40
Chlorobenzene	1000
Chloroform	300
Dichloromethane	400
Ethylbenzene	2000
Ethylene glycol	400
Formaldehyde	27
n-Hexane	7000
Naphthalene	9
Nonanal ^a	13
Octanal ^a	7.2
Particulates (PM 2.5)	35 (24-hr)
Particulates (PM 10)	150 (24-hr)
Phenol	200
Styrene	900
Tetrachloroethene	35
Toluene	300
Total volatile organic compounds (TVOC)	500
Trichloroethene	600
Xylene isomers	700

a. This chemical has a limit only where carpets and fabrics with styrene butadiene rubber (SBR) latex backing material are installed as part of the base building systems.

b. The concentrations in the Table are to be applied after outdoor levels of these compounds are subtracted from the indoor levels.

ug/m³ = micrograms per cubic meter ppm = parts per million

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action

Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Text for 804.2

Tentatively identified compounds (TICs) and the use of toluene for determining a TVOC equivalent concentration for the VOCs detected is referenced in Section 3.9.4 of the California "Standard Method For The Testing And Evaluation Of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers Version 1.1 - California Specification 01350. – Feb. 2010" which is also identified in Section 806 of this Code. These criteria are common aspects of the methods used by IAQ professionals for determining indoor Total VOC concentrations.

The ASTM methods described are not commonly used by air sampling/IAQ professionals so "or equivalents" was added so that the methods that are used (EPA TO-15 and TO-17) wouldn't be excluded.

Since those who construct buildings have no control over the outdoor air why should they be held accountable for its contribution to indoor air pollution? As such, the 500 micrograms per cubic meter TVOC maximum should be for what is due to indoor air contaminants over which contractors can have control. Outdoor air levels should be subtracted from the Total VOC levels found indoors. This approach is supported in Table 3.1 of the EPA specification titled "Testing for Indoor Air Quality, Baseline IAQ, and Materials Division 1 Section 01445" and "Section 01 81 09 - testing for indoor air quality".

The VOCs in Table 804.2, when identified by the TVOC test described in the text, will have their concentrations compared to those in the Table and they should not exceed those levels. This is to help insure that particularly hazardous VOCs are not above levels of concern even though the TVOC levels may have met the 500 ug/m³ criteria.

Formaldehyde is called out separately because it requires a different collection and analysis method and it is of particular concern regarding IAQ. Its evaluation would help determine whether low or no formaldehyde emitting products were actually used in the project.

The four hour minimal sampling time is provided so that sampling times will not be so short as to give results with too high a detection limit making them useless for comparison to the criteria specified. This time limit has been a part of LEED for many years.

Table 804.2

"Indoor" and the b. note below the Table are added to clarify that the compounds and maximum concentrations are for indoors. Correcting for outdoor levels has been discussed previously.

"Unless otherwise noted" was eliminated because it no longer applies if the changes are made as proposed.

Compounds with maximum concentrations above 500 ug/m³ were removed because the 500 ug/m³ maximum concentration for TVOCs would already be exceeded if these levels were present. The TVOC measurement makes evaluating these compounds unnecessary.

PM10 and PM2.5 are eliminated because they are not VOCs and they are EPA outdoor air standards which are not applicable to indoor air quality (my professional opinion). A building being tested after construction and before occupancy should not have these particles in the air unless they were due to the outdoors (discussed previously) or due to occupants disturbing or generating the particles which should not be the case. Particles would come from occupant activities, poor filtration of the particles generated by indoor activities, the outdoors, and/or from poor housekeeping. None of these things are the responsibility of the builder except for the filtration which should be evaluated in the commissioning phase and be an on-going maintenance issue. A better determinate would be visible dust which would be an unacceptable condition for the new occupants and would be a punch list item to be corrected.

Carbon monoxide is eliminated because it is not a VOC and it is not a building material emission product. It is associated with combustion which may be related to use issues but not construction issues, especially when construction is supposed to be complete.

The meanings of ug/m³ and ppm were added to the end of the table for clarification.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG 234-14 : 804.2-THOMPSON1243

GG235-14

202 (New), 804.3 (New), Table 804.3 (New)

Proponent: David Kapturowski, representing American Association of Radon Scientists and Technologists (dave@spruce.com)

Add new text as follows:

804.3 Radon Testing Where a building site indicates a potential for elevated indoor *radon* concentrations, as shown by the United States Environmental Protection Agency zones 1 and 2 in Figure 804.3 or from the United States Environmental Protection Agency *radon* potential by county listing in Table 804.3, *radon* testing shall be performed prior to occupancy of the building. Such testing shall be performed by a *qualified radon* measurement professional. Where state or local jurisdictions have published radon potential data, such data shall supersede the information in Figure 804.3 and Table 804.3. Indoor radon levels shall not exceed the United States Environmental Protection Agency Radon Action Level of 4 pCi/L.

TABLE 804.3
EPA Radon Zones by County

<u>ALABAMA</u>	<u>ALASKA</u>	<u>Zone 2</u>	<u>Gilpin</u>	<u>New Haven</u>
<u>Zone 1</u>	<u>Zone 2</u>	<u>Alameda</u>	<u>Grand</u>	<u>New London</u>
<u>Calhoun</u>	<u>Anchorage Municipality</u>	<u>Alpine</u>	<u>Gunnison</u>	
<u>Clay</u>	<u>Dillingham Census Area</u>	<u>Amador</u>	<u>Huerfano</u>	<u>Zone 2</u>
<u>Cleburne</u>	<u>Fairbanks North Star Borough</u>	<u>Calaveras</u>	<u>Jackson</u>	<u>Litchfield</u>
<u>Colbert</u>		<u>Contra Costa</u>	<u>Jefferson</u>	<u>Tolland</u>
<u>Coosa</u>	<u>Kenai Peninsula Borough</u>	<u>El Dorado</u>	<u>Kiowa</u>	<u>Windham</u>
<u>Franklin</u>		<u>Fresno</u>	<u>Kit Carson</u>	
<u>Jackson</u>	<u>Matanuska-Susitna Borough</u>	<u>Inyo</u>	<u>La Plata</u>	<u>DELAWARE</u>
<u>Lauderdale</u>		<u>Kern</u>	<u>Larimer</u>	<u>Zone 2</u>
<u>Lawrence</u>	<u>Southeast Fairbanks Census Area</u>	<u>Los Angeles</u>	<u>Las Animas</u>	<u>New Castle</u>
<u>Limestone</u>		<u>Madera</u>	<u>Lincoln</u>	
<u>Madison</u>		<u>Mariposa</u>	<u>Logan</u>	<u>FLORIDA</u>
<u>Morgan</u>	<u>ARIZONA</u>	<u>Mono</u>	<u>Mesa</u>	<u>Zone 2</u>
<u>Talladega</u>	<u>Zone 2</u>	<u>Monterey</u>	<u>Moffat</u>	<u>Alachua</u>
	<u>Apache</u>	<u>Nevada</u>	<u>Montezuma</u>	<u>Citrus</u>
<u>Zone 2</u>	<u>Cochise</u>	<u>Placer</u>	<u>Montrose</u>	<u>Columbia</u>
<u>Autauga</u>	<u>Coconino</u>	<u>Plumas</u>	<u>Morgan</u>	<u>Hillsborough</u>
<u>Barbour</u>	<u>Gila</u>	<u>Riverside</u>	<u>Otero</u>	<u>Leon</u>
<u>Bibb</u>	<u>Graham</u>	<u>San Benito</u>	<u>Ouray</u>	<u>Marion</u>
<u>Blount</u>	<u>Greenlee</u>	<u>San Bernardino</u>	<u>Park</u>	<u>Miami-Dade</u>
<u>Bullock</u>	<u>La Paz</u>	<u>San Francisco</u>	<u>Phillips</u>	<u>Polk</u>
<u>Cherokee</u>	<u>Maricopa</u>	<u>San Luis Obispo</u>	<u>Pitkin</u>	<u>Union</u>
<u>Chilton</u>	<u>Mohave</u>	<u>San Mateo</u>	<u>Prowers</u>	
<u>Cullman</u>	<u>Navajo</u>	<u>Santa Clara</u>	<u>Pueblo</u>	<u>GEORGIA</u>
<u>Dallas</u>	<u>Pima</u>	<u>Santa Cruz</u>	<u>Rio Blanco</u>	<u>Zone 1</u>
<u>DeKalb</u>	<u>Pinal</u>	<u>Sierra</u>	<u>San Miguel</u>	<u>Cobb</u>
<u>Elmore</u>	<u>Santa Cruz</u>	<u>Tulare</u>	<u>Sedgwick</u>	<u>DeKalb</u>

<u>Etowah</u>	<u>Yavapai</u>	<u>Tuolumne</u>	<u>Summit</u>	<u>Fulton</u>
<u>Fayette</u>	<u>Yuma</u>	<u>Yuba</u>	<u>Teller</u>	<u>Gwinnett</u>
<u>Greene</u>			<u>Washington</u>	
<u>Hale</u>	ARKANSAS	COLORADO	<u>Weld</u>	Zone 2
<u>Jefferson</u>	Zone 2	Zone 1	<u>Yuma</u>	<u>Banks</u>
<u>Lamar</u>	<u>Baxter</u>	<u>Adams</u>		<u>Barrow</u>
<u>Lee</u>	<u>Benton</u>	<u>Arapahoe</u>	Zone 2	<u>Bartow</u>
<u>Lowndes</u>	<u>Boone</u>	<u>Baca</u>	<u>Alamosa</u>	<u>Butts</u>
<u>Macon</u>	<u>Carroll</u>	<u>Bent</u>	<u>Archuleta</u>	<u>Carroll</u>
<u>Marion</u>	<u>Fulton</u>	<u>Boulder</u>	<u>Conejos</u>	<u>Catoosa</u>
<u>Marshall</u>	<u>Garland</u>	<u>Broomfield</u>	<u>Costilla</u>	<u>Cherokee</u>
<u>Montgomery</u>	<u>Independence</u>	<u>Chaffee</u>	<u>Eagle</u>	<u>Clarke</u>
<u>Perry</u>	<u>Izard</u>	<u>Cheyenne</u>	<u>Hinsdale</u>	<u>Clayton</u>
<u>Pickens</u>	<u>Marion</u>	<u>Clear Creek</u>	<u>Lake</u>	<u>Coweta</u>
<u>Randolph</u>	<u>Montgomery</u>	<u>Crowley</u>	<u>Mineral</u>	<u>Dawson</u>
<u>Russell</u>	<u>Randolph</u>	<u>Custer</u>	<u>Rio Grande</u>	<u>Douglas</u>
<u>Shelby</u>	<u>Searcy</u>	<u>Delta</u>	<u>Routt</u>	<u>Elbert</u>
<u>St Clair</u>	<u>Sharp</u>	<u>Denver</u>	<u>Saguache</u>	<u>Fannin</u>
<u>Sumter</u>	<u>Stone</u>	<u>Dolores</u>	<u>San Juan</u>	<u>Fayette</u>
<u>Tuscaloosa</u>		<u>Douglas</u>		<u>Floyd</u>
<u>Walker</u>	CALIFORNIA	<u>El Paso</u>	CONNECTICUT	<u>Forsyth</u>
<u>Winston</u>	Zone 1	<u>Elbert</u>	Zone 1	<u>Franklin</u>
	<u>Santa Barbara</u>	<u>Fremont</u>	<u>Fairfield</u>	<u>Gilmer</u>
	<u>Ventura</u>	<u>Garfield</u>	<u>Middlesex</u>	<u>Greene</u>
<u>Habersham</u>	<u>Idaho</u>	<u>Jersey</u>	<u>Hardin</u>	<u>Hendricks</u>
<u>Hall</u>	<u>Kootenai</u>	<u>Jo Daviess</u>	<u>Jackson</u>	<u>Henry</u>
<u>Haralson</u>	<u>Latah</u>	<u>Kane</u>	<u>Jasper</u>	<u>Howard</u>
<u>Harris</u>	<u>Lemhi</u>	<u>Kendall</u>	<u>Jefferson</u>	<u>Huntington</u>
<u>Hart</u>	<u>Shoshone</u>	<u>Knox</u>	<u>Johnson</u>	<u>Jay</u>
<u>Heard</u>	<u>Valley</u>	<u>LaSalle</u>	<u>Kankakee</u>	<u>Jennings</u>
<u>Henry</u>		<u>Lee</u>	<u>Lake</u>	<u>Johnson</u>
<u>Jackson</u>	Zone 2	<u>Livingston</u>	<u>Lawrence</u>	<u>Kosciusko</u>
<u>Jasper</u>	<u>Ada</u>	<u>Logan</u>	<u>Macoupin</u>	<u>LaGrange</u>
<u>Lamar</u>	<u>Bannock</u>	<u>Macon</u>	<u>Madison</u>	<u>Lawrence</u>
<u>Lumpkin</u>	<u>Bear Lake</u>	<u>Marshall</u>	<u>Marion</u>	<u>Madison</u>
<u>Madison</u>	<u>Bingham</u>	<u>Mason</u>	<u>McHenry</u>	<u>Marion</u>
<u>Meriwether</u>	<u>Bonneville</u>	<u>McDonough</u>	<u>Monroe</u>	<u>Marshall</u>
<u>Monroe</u>	<u>Canyon</u>	<u>McLean</u>	<u>Montgomery</u>	<u>Miami</u>
<u>Morgan</u>	<u>Caribou</u>	<u>Menard</u>	<u>Perry</u>	<u>Monroe</u>
<u>Newton</u>	<u>Cassia</u>	<u>Mercer</u>	<u>Pope</u>	<u>Montgomery</u>
<u>Oconee</u>	<u>Franklin</u>	<u>Morgan</u>	<u>Randolph</u>	<u>Noble</u>
<u>Oglethorpe</u>	<u>Jefferson</u>	<u>Moultrie</u>	<u>Richland</u>	<u>Orange</u>
<u>Paulding</u>	<u>Jerome</u>	<u>Ogle</u>	<u>Saline</u>	<u>Putnam</u>
<u>Pickens</u>	<u>Lincoln</u>	<u>Peoria</u>	<u>Shelby</u>	<u>Randolph</u>
<u>Pike</u>	<u>Madison</u>	<u>Piatt</u>	<u>St Clair</u>	<u>Rush</u>
<u>Rabun</u>	<u>Minidoka</u>	<u>Pike</u>	<u>Union</u>	<u>Scott</u>

<u>Richmond</u>	<u>Oneida</u>	<u>Putnam</u>	<u>Wabash</u>	<u>Shelby</u>
<u>Rockdale</u>	<u>Owyhee</u>	<u>Rock Island</u>	<u>Washington</u>	<u>St Joseph</u>
<u>Spalding</u>	<u>Payette</u>	<u>Sangamon</u>	<u>Wayne</u>	<u>Steuben</u>
<u>Stephens</u>	<u>Power</u>	<u>Schuyler</u>	<u>White</u>	<u>Tippecanoe</u>
<u>Talbot</u>	<u>Teton</u>	<u>Scott</u>	<u>Will</u>	<u>Tipton</u>
<u>Towns</u>	<u>Twin Falls</u>	<u>Stark</u>	<u>Williamson</u>	<u>Union</u>
<u>Troup</u>		<u>Stephenson</u>		<u>Vermillion</u>
<u>Union</u>	ILLINOIS	<u>Tazewell</u>	INDIANA	<u>Wabash</u>
<u>Upson</u>	Zone 1	<u>Vermilion</u>	Zone 1	<u>Warren</u>
<u>Walker</u>	<u>Adams</u>	<u>Warren</u>	<u>Adams</u>	<u>Washington</u>
<u>Walton</u>	<u>Boone</u>	<u>Whiteside</u>	<u>Allen</u>	<u>Wayne</u>
<u>White</u>	<u>Brown</u>	<u>Winnebago</u>	<u>Bartholomew</u>	<u>Wells</u>
<u>Whitfield</u>	<u>Bureau</u>	<u>Woodford</u>	<u>Benton</u>	<u>White</u>
	<u>Calhoun</u>		<u>Blackford</u>	<u>Whitley</u>
IDAHO	<u>Carroll</u>	Zone 2	<u>Boone</u>	
Zone 1	<u>Cass</u>	<u>Bond</u>	<u>Carroll</u>	Zone 2
<u>Benewah</u>	<u>Champaign</u>	<u>Christian</u>	<u>Cass</u>	<u>Brown</u>
<u>Blaine</u>	<u>Coles</u>	<u>Clark</u>	<u>Clark</u>	<u>Clay</u>
<u>Boise</u>	<u>De Kalb</u>	<u>Clay</u>	<u>Clinton</u>	<u>Crawford</u>
<u>Bonner</u>	<u>De Witt</u>	<u>Clinton</u>	<u>De Kalb</u>	<u>Daviess</u>
<u>Boundary</u>	<u>Douglas</u>	<u>Cook</u>	<u>Decatur</u>	<u>Dearborn</u>
<u>Butte</u>	<u>Edgar</u>	<u>Crawford</u>	<u>Delaware</u>	<u>Dubois</u>
<u>Camas</u>	<u>Ford</u>	<u>Cumberland</u>	<u>Elkhart</u>	<u>Floyd</u>
<u>Clark</u>	<u>Fulton</u>	<u>DuPage</u>	<u>Fayette</u>	<u>Franklin</u>
<u>Clearwater</u>	<u>Greene</u>	<u>Edwards</u>	<u>Fountain</u>	<u>Gibson</u>
<u>Custer</u>	<u>Grundy</u>	<u>Effingham</u>	<u>Fulton</u>	<u>Greene</u>
<u>Elmore</u>	<u>Hancock</u>	<u>Fayette</u>	<u>Grant</u>	<u>Jackson</u>
<u>Fremont</u>	<u>Henderson</u>	<u>Franklin</u>	<u>Hamilton</u>	<u>Jasper</u>
<u>Gooding</u>	<u>Henry</u>	<u>Gallatin</u>	<u>Hancock</u>	<u>Jefferson</u>
	<u>Iroquois</u>	<u>Hamilton</u>	<u>Harrison</u>	<u>Knox</u>
<u>Lake</u>	<u>Des Moines</u>	<u>Sac</u>	<u>Lincoln</u>	<u>Elk</u>
<u>LaPorte</u>	<u>Dickinson</u>	<u>Scott</u>	<u>Logan</u>	<u>Franklin</u>
<u>Martin</u>	<u>Dubuque</u>	<u>Shelby</u>	<u>Marion</u>	<u>Greenwood</u>
<u>Morgan</u>	<u>Emmet</u>	<u>Sioux</u>	<u>Marshall</u>	<u>Harper</u>
<u>Newton</u>	<u>Fayette</u>	<u>Story</u>	<u>McPherson</u>	<u>Harvey</u>
<u>Ohio</u>	<u>Floyd</u>	<u>Tama</u>	<u>Meade</u>	<u>Jefferson</u>
<u>Owen</u>	<u>Franklin</u>	<u>Taylor</u>	<u>Mitchell</u>	<u>Labette</u>
<u>Parke</u>	<u>Fremont</u>	<u>Union</u>	<u>Nemaha</u>	<u>Linn</u>
<u>Perry</u>	<u>Greene</u>	<u>Van Buren</u>	<u>Ness</u>	<u>Lyon</u>
<u>Pike</u>	<u>Grundy</u>	<u>Wapello</u>	<u>Norton</u>	<u>Miami</u>
<u>Porter</u>	<u>Guthrie</u>	<u>Warren</u>	<u>Osborne</u>	<u>Montgomery</u>
<u>Posey</u>	<u>Hamilton</u>	<u>Washington</u>	<u>Ottawa</u>	<u>Morris</u>
<u>Pulaski</u>	<u>Hancock</u>	<u>Wayne</u>	<u>Pawnee</u>	<u>Morton</u>
<u>Ripley</u>	<u>Hardin</u>	<u>Webster</u>	<u>Phillips</u>	<u>Neosho</u>
<u>Spencer</u>	<u>Harrison</u>	<u>Winnebago</u>	<u>Pottawatomie</u>	<u>Osage</u>
<u>Starke</u>	<u>Henry</u>	<u>Winneshiek</u>	<u>Pratt</u>	<u>Reno</u>

<u>Sullivan</u>	<u>Howard</u>	<u>Woodbury</u>	<u>Rawlins</u>	<u>Sedgwick</u>
<u>Switzerland</u>	<u>Humboldt</u>	<u>Worth</u>	<u>Republic</u>	<u>Seward</u>
<u>Vanderburgh</u>	<u>Ida</u>	<u>Wright</u>	<u>Rice</u>	<u>Shawnee</u>
<u>Vigo</u>	<u>Iowa</u>		<u>Riley</u>	<u>Stafford</u>
<u>Warrick</u>	<u>Jackson</u>	<u>KANSAS</u>	<u>Rooks</u>	<u>Stevens</u>
	<u>Jasper</u>	<u>Zone 1</u>	<u>Rush</u>	<u>Sumner</u>
<u>IOWA</u>	<u>Jefferson</u>	<u>Atchison</u>	<u>Russell</u>	<u>Wabaunsee</u>
<u>Zone 1</u>	<u>Johnson</u>	<u>Barton</u>	<u>Saline</u>	<u>Wilson</u>
<u>Adair</u>	<u>Jones</u>	<u>Brown</u>	<u>Scott</u>	<u>Woodson</u>
<u>Adams</u>	<u>Keokuk</u>	<u>Cheyenne</u>	<u>Sheridan</u>	
<u>Allamakee</u>	<u>Kossuth</u>	<u>Clay</u>	<u>Sherman</u>	<u>KENTUCKY</u>
<u>Appanoose</u>	<u>Lee</u>	<u>Cloud</u>	<u>Smith</u>	<u>Zone 1</u>
<u>Audubon</u>	<u>Linn</u>	<u>Decatur</u>	<u>Stanton</u>	<u>Adair</u>
<u>Benton</u>	<u>Louisa</u>	<u>Dickinson</u>	<u>Thomas</u>	<u>Allen</u>
<u>Black Hawk</u>	<u>Lucas</u>	<u>Douglas</u>	<u>Trego</u>	<u>Barren</u>
<u>Boone</u>	<u>Lyon</u>	<u>Ellis</u>	<u>Wallace</u>	<u>Bourbon</u>
<u>Bremer</u>	<u>Madison</u>	<u>Ellsworth</u>	<u>Washington</u>	<u>Boyle</u>
<u>Buchanan</u>	<u>Mahaska</u>	<u>Finney</u>	<u>Wichita</u>	<u>Bullitt</u>
<u>Buena Vista</u>	<u>Marion</u>	<u>Ford</u>	<u>Wyandotte</u>	<u>Casey</u>
<u>Butler</u>	<u>Marshall</u>	<u>Geary</u>		<u>Clark</u>
<u>Calhoun</u>	<u>Mills</u>	<u>Gove</u>	<u>Zone 2</u>	<u>Cumberland</u>
<u>Carroll</u>	<u>Mitchell</u>	<u>Graham</u>	<u>Allen</u>	<u>Fayette</u>
<u>Cass</u>	<u>Monona</u>	<u>Grant</u>	<u>Anderson</u>	<u>Franklin</u>
<u>Cedar</u>	<u>Monroe</u>	<u>Gray</u>	<u>Barber</u>	<u>Green</u>
<u>Cerro Gordo</u>	<u>Montgomery</u>	<u>Greeley</u>	<u>Bourbon</u>	<u>Harrison</u>
<u>Cherokee</u>	<u>Muscatine</u>	<u>Hamilton</u>	<u>Butler</u>	<u>Hart</u>
<u>Chickasaw</u>	<u>O'Brien</u>	<u>Haskell</u>	<u>Chase</u>	<u>Jefferson</u>
<u>Clarke</u>	<u>Osceola</u>	<u>Hodgeman</u>	<u>Chautauqua</u>	<u>Jessamine</u>
<u>Clay</u>	<u>Page</u>	<u>Jackson</u>	<u>Cherokee</u>	<u>Lincoln</u>
<u>Clayton</u>	<u>Palo Alto</u>	<u>Jewell</u>	<u>Clark</u>	<u>Marion</u>
<u>Clinton</u>	<u>Plymouth</u>	<u>Johnson</u>	<u>Coffey</u>	<u>Mercer</u>
<u>Crawford</u>	<u>Pocahontas</u>	<u>Kearny</u>	<u>Comanche</u>	<u>Metcalfe</u>
<u>Dallas</u>	<u>Polk</u>	<u>Kingman</u>	<u>Cowley</u>	<u>Monroe</u>
<u>Davis</u>	<u>Pottawattamie</u>	<u>Kiowa</u>	<u>Crawford</u>	<u>Nelson</u>
<u>Decatur</u>	<u>Poweshiek</u>	<u>Lane</u>	<u>Doniphan</u>	<u>Pendleton</u>
<u>Delaware</u>	<u>Ringgold</u>	<u>Leavenworth</u>	<u>Edwards</u>	<u>Pulaski</u>
<u>Robertson</u>	<u>Letcher</u>	<u>York</u>	<u>Jackson</u>	<u>Douglas</u>
<u>Russell</u>	<u>Lewis</u>	<u>Zone 2</u>	<u>Kalamazoo</u>	<u>Faribault Count</u>
<u>Scott</u>	<u>Livingston</u>	<u>Knox</u>	<u>Lenawee</u>	<u>Fillmore</u>
<u>Taylor</u>	<u>Logan</u>	<u>Sagadahoc</u>	<u>St Joseph</u>	<u>Freeborn</u>
<u>Warren</u>	<u>Lyon</u>	<u>Waldo</u>	<u>Washtenaw</u>	<u>Goodhue</u>
<u>Woodford</u>	<u>Madison</u>	<u>Washington</u>		<u>Grant</u>
	<u>Magoffin</u>		<u>Zone 2</u>	<u>Hennepin</u>
<u>Zone 2</u>	<u>Martin</u>	<u>MARYLAND</u>	<u>Alcona</u>	<u>Houston</u>
<u>Anderson</u>	<u>Mason</u>	<u>Zone 1</u>	<u>Alger</u>	<u>Hubbard</u>
<u>Bath</u>	<u>McCreary</u>	<u>Baltimore</u>	<u>Alpena</u>	<u>Jackson</u>

<u>Bell</u>	<u>McLean</u>	<u>Calvert</u>	<u>Antrim</u>	<u>Kanabec</u>
<u>Boone</u>	<u>Meade</u>	<u>Carroll</u>	<u>Baraga</u>	<u>Kandiyohi</u>
<u>Boyd</u>	<u>Menifee</u>	<u>Frederick</u>	<u>Barry</u>	<u>Kittson</u>
<u>Bracken</u>	<u>Montgomery</u>	<u>Harford</u>	<u>Charlevoix</u>	<u>Lac qui Parle</u>
<u>Breathitt</u>	<u>Morgan</u>	<u>Howard</u>	<u>Clinton</u>	<u>Le Sueur</u>
<u>Breckinridge</u>	<u>Muhlenberg</u>	<u>Montgomery</u>	<u>Dickinson</u>	<u>Lincoln</u>
<u>Butler</u>	<u>Nicholas</u>	<u>Washington</u>	<u>Eaton</u>	<u>Lyon</u>
<u>Caldwell</u>	<u>Ohio</u>		<u>Emmet</u>	<u>Mahnomen</u>
<u>Campbell</u>	<u>Oldham</u>	<u>Zone 2</u>	<u>Genesee</u>	<u>Marshall</u>
<u>Carroll</u>	<u>Owen</u>	<u>Alleghany</u>	<u>Gogebic</u>	<u>Martin</u>
<u>Carter</u>	<u>Owsley</u>	<u>Anne Arundel</u>	<u>Houghton</u>	<u>McLeod</u>
<u>Christian</u>	<u>Perry</u>	<u>Baltimore City</u>	<u>Ingham</u>	<u>Meeker</u>
<u>Clay</u>	<u>Pike</u>	<u>Cecil</u>	<u>Ionia</u>	<u>Mower</u>
<u>Clinton</u>	<u>Powell</u>	<u>Charles</u>	<u>Iron</u>	<u>Murray</u>
<u>Crittenden</u>	<u>Rockcastle</u>	<u>Garrett</u>	<u>Kent</u>	<u>Nicollet</u>
<u>Davies</u>	<u>Rowan</u>	<u>Prince George's</u>	<u>Keweenaw</u>	<u>Nobles</u>
<u>Edmonson</u>	<u>Shelby</u>	<u>Somerset</u>	<u>Lapeer</u>	<u>Norman</u>
<u>Elliott</u>	<u>Simpson</u>		<u>Leelanau</u>	<u>Olmsted</u>
<u>Estill</u>	<u>Spencer</u>	<u>MASSACHUSETTS</u>	<u>Livingston</u>	<u>Otter Tail</u>
<u>Fleming</u>	<u>Todd</u>	<u>Zone 1</u>	<u>Marquette</u>	<u>Pennington</u>
<u>Floyd</u>	<u>Trigg</u>	<u>Essex</u>	<u>Menominee</u>	<u>Pipestone</u>
<u>Gallatin</u>	<u>Trimble</u>	<u>Middlesex</u>	<u>Monroe</u>	<u>Polk</u>
<u>Garrard</u>	<u>Union</u>	<u>Worcester</u>	<u>Montcalm</u>	<u>Pope</u>
<u>Grant</u>	<u>Washington</u>		<u>Montmorency</u>	<u>Ramsey</u>
<u>Grayson</u>	<u>Wayne</u>	<u>Zone 2</u>	<u>Oakland</u>	<u>Red Lake</u>
<u>Greenup</u>	<u>Webster</u>	<u>Barnstable</u>	<u>Otsego</u>	<u>Redwood</u>
<u>Hancock</u>	<u>Whitley</u>	<u>Berkshire</u>	<u>Presque Isle</u>	<u>Renville</u>
<u>Hardin</u>	<u>Wolfe</u>	<u>Bristol</u>	<u>Sanilac</u>	<u>Rice</u>
<u>Harlan</u>		<u>Dukes</u>	<u>Shiawassee</u>	<u>Rock</u>
<u>Henderson</u>	<u>MAINE</u>	<u>Franklin</u>		<u>Roseau</u>
<u>Henry</u>	<u>Zone 1</u>	<u>Hampden</u>	<u>MINNESOTA</u>	<u>Scott</u>
<u>Hopkins</u>	<u>Androscoggin</u>	<u>Hampshire</u>	<u>Zone 1</u>	<u>Sherburne</u>
<u>Jackson</u>	<u>Aroostook</u>	<u>Nantucket</u>	<u>Becker</u>	<u>Sibley</u>
<u>Johnson</u>	<u>Cumberland</u>	<u>Norfolk</u>	<u>Big Stone</u>	<u>Stearns</u>
<u>Kenton</u>	<u>Franklin</u>	<u>Plymouth</u>	<u>Blue Earth</u>	<u>Steele</u>
<u>Knott</u>	<u>Hancock</u>		<u>Brown</u>	<u>Stevens</u>
<u>Knox</u>	<u>Kennebec</u>	<u>MICHIGAN</u>	<u>Carver</u>	<u>Swift</u>
<u>Larue</u>	<u>Lincoln</u>	<u>Zone 1</u>	<u>Chippewa</u>	<u>Todd</u>
<u>Laurel</u>	<u>Oxford</u>	<u>Branch</u>	<u>Clay</u>	<u>Traverse</u>
<u>Lawrence</u>	<u>Penobscot</u>	<u>Calhoun</u>	<u>Cottonwood</u>	<u>Wabasha</u>
<u>Lee</u>	<u>Piscataquis</u>	<u>Cass</u>	<u>Dakota</u>	<u>Wadena</u>
<u>Leslie</u>	<u>Somerset</u>	<u>Hillsdale</u>	<u>Dodge</u>	<u>Waseca</u>
<u>Washington</u>	<u>Nodaway</u>	<u>Macon</u>	<u>Beaverhead</u>	<u>Musselshell</u>
<u>Watonwan</u>	<u>Platte</u>	<u>Madison</u>	<u>Big Horn</u>	<u>Petroleum</u>
<u>Wilkin</u>		<u>Maries</u>	<u>Blaine</u>	<u>Sweet Grass</u>
<u>Winona</u>	<u>Zone 2</u>	<u>Marion</u>	<u>Broadwater</u>	<u>Treasure</u>

<u>Wright</u>	<u>Adair</u>	<u>McDonald</u>	<u>Carbon</u>	<u>Wheatland</u>
<u>Yellow Medicine</u>	<u>Audrain</u>	<u>Mercer</u>	<u>Carter</u>	<u>Yellowstone</u>
	<u>Barry</u>	<u>Miller</u>	<u>Cascade</u>	
<u>Zone 2</u>	<u>Barton</u>	<u>Moniteau</u>	<u>Chouteau</u>	<u>NEBRASKA</u>
<u>Aitkin</u>	<u>Bates</u>	<u>Monroe</u>	<u>Custer</u>	<u>Zone 1</u>
<u>Anoka</u>	<u>Benton</u>	<u>Montgomery</u>	<u>Daniels</u>	<u>Adams</u>
<u>Beltrami</u>	<u>Bollinger</u>	<u>Morgan</u>	<u>Dawson</u>	<u>Boone</u>
<u>Benton</u>	<u>Boone</u>	<u>Newton</u>	<u>Deer Lodge</u>	<u>Boyd</u>
<u>Carlton</u>	<u>Caldwell</u>	<u>Oregon</u>	<u>Fallon</u>	<u>Burt</u>
<u>Cass</u>	<u>Callaway</u>	<u>Osage</u>	<u>Fergus</u>	<u>Butler</u>
<u>Chisago</u>	<u>Camden</u>	<u>Ozark</u>	<u>Flathead</u>	<u>Cass</u>
<u>Clearwater</u>	<u>Cape Girardeau</u>	<u>Perry</u>	<u>Gallatin</u>	<u>Cedar</u>
<u>Cook</u>	<u>Carroll</u>	<u>Pettis</u>	<u>Garfield</u>	<u>Clay</u>
<u>Crow Wing</u>	<u>Carter</u>	<u>Phelps</u>	<u>Glacier</u>	<u>Colfax</u>
<u>Isanti</u>	<u>Cedar</u>	<u>Pike</u>	<u>Granite</u>	<u>Cuming</u>
<u>Itasca</u>	<u>Chariton</u>	<u>Polk</u>	<u>Hill</u>	<u>Dakota</u>
<u>Koochiching</u>	<u>Christian</u>	<u>Pulaski</u>	<u>Jefferson</u>	<u>Dixon</u>
<u>Lake</u>	<u>Clark</u>	<u>Putnam</u>	<u>Judith Basin</u>	<u>Dodge</u>
<u>Lake of the Woods</u>	<u>Cole</u>	<u>Ralls</u>	<u>Lake</u>	<u>Douglas</u>
<u>Mille Lacs</u>	<u>Cooper</u>	<u>Randolph</u>	<u>Lewis and Clark</u>	<u>Fillmore</u>
<u>Morrison</u>	<u>Crawford</u>	<u>Ray</u>	<u>Liberty</u>	<u>Franklin</u>
<u>Pine</u>	<u>Dade</u>	<u>Reynolds</u>	<u>Lincoln</u>	<u>Frontier</u>
<u>St Louis</u>	<u>Dallas</u>	<u>Ripley</u>	<u>Madison</u>	<u>Furnas</u>
	<u>Daviss</u>	<u>Saline</u>	<u>McCone</u>	<u>Gage</u>
<u>MISSISSIPPI</u>	<u>DeKalb</u>	<u>Schuyler</u>	<u>Meagher</u>	<u>Gosper</u>
<u>Zone 2</u>	<u>Dent</u>	<u>Scotland</u>	<u>Mineral</u>	<u>Greeley</u>
<u>Alcorn</u>	<u>Douglas</u>	<u>Shannon</u>	<u>Missoula</u>	<u>Hamilton</u>
<u>Chickasaw</u>	<u>Franklin</u>	<u>Shelby</u>	<u>Park</u>	<u>Harlan</u>
<u>Clay</u>	<u>Gasconade</u>	<u>St Charles</u>	<u>Phillips</u>	<u>Hayes</u>
<u>Lee</u>	<u>Gentry</u>	<u>St Clair</u>	<u>Pondera</u>	<u>Hitchcock</u>
<u>Lowndes</u>	<u>Greene</u>	<u>St Francois</u>	<u>Powder River</u>	<u>Jefferson</u>
<u>Noxubee</u>	<u>Grundy</u>	<u>St Louis city</u>	<u>Powell</u>	<u>Johnson</u>
<u>Pontotoc</u>	<u>Harrison</u>	<u>St Louis</u>	<u>Prairie</u>	<u>Kearney</u>
<u>Rankin</u>	<u>Henry</u>	<u>Ste Genevieve</u>	<u>Ravalli</u>	<u>Knox</u>
<u>Union</u>	<u>Hickory</u>	<u>Stone</u>	<u>Richland</u>	<u>Lancaster</u>
<u>Washington</u>	<u>Howard</u>	<u>Sullivan</u>	<u>Roosevelt</u>	<u>Madison</u>
	<u>Howell</u>	<u>Taney</u>	<u>Rosebud</u>	<u>Nance</u>
<u>MISSOURI</u>	<u>Jasper</u>	<u>Texas</u>	<u>Sanders</u>	<u>Nemaha</u>
<u>Zone 1</u>	<u>Jefferson</u>	<u>Vernon</u>	<u>Sheridan</u>	<u>Nuckolls</u>
<u>Andrew</u>	<u>Johnson</u>	<u>Warren</u>	<u>Silver Bow</u>	<u>Otoe</u>
<u>Atchison</u>	<u>Knox</u>	<u>Washington</u>	<u>Stillwater</u>	<u>Pawnee</u>
<u>Buchanan</u>	<u>Laclede</u>	<u>Wayne</u>	<u>Teton</u>	<u>Phelps</u>
<u>Cass</u>	<u>Lafayette</u>	<u>Webster</u>	<u>Toole</u>	<u>Pierce</u>
<u>Clay</u>	<u>Lawrence</u>	<u>Worth</u>	<u>Valley</u>	<u>Platte</u>
<u>Clinton</u>	<u>Lewis</u>	<u>Wright</u>	<u>Wibaux</u>	<u>Polk</u>
<u>Holt</u>	<u>Lincoln</u>			<u>Red Willow</u>

<u>Iron</u>	<u>Linn</u>	MONTANA	<u>Zone 2</u>	<u>Richardson</u>
<u>Jackson</u>	<u>Livingston</u>	<u>Zone 1</u>	<u>Golden Valley</u>	<u>Saline</u>
<u>Sarpy</u>	<u>Esmeralda</u>	<u>Taos</u>	<u>Putnam</u>	<u>Gaston</u>
<u>Saunders</u>	<u>Humboldt</u>	<u>Zone 2</u>	<u>Rensselaer</u>	<u>Graham</u>
<u>Seward</u>	<u>Nye</u>	<u>Catron</u>	<u>Schoharie</u>	<u>Haywood</u>
<u>Stanton</u>	<u>Storey</u>	<u>Chaves</u>	<u>Schuyler</u>	<u>Iredell</u>
<u>Thayer</u>	<u>Washoe</u>	<u>Cibola</u>	<u>Seneca</u>	<u>Jackson</u>
<u>Thurston</u>		<u>Curry</u>	<u>Steuben</u>	<u>Lincoln</u>
<u>Washington</u>	NEW HAMPSHIRE	<u>De Baca</u>	<u>Sullivan</u>	<u>Macon</u>
<u>Wayne</u>	<u>Zone 1</u>	<u>Dona Ana</u>	<u>Tioga</u>	<u>Madison</u>
<u>Webster</u>	<u>Carroll</u>	<u>Eddy</u>	<u>Tompkins</u>	<u>McDowell</u>
<u>York</u>		<u>Grant</u>	<u>Ulster</u>	<u>Polk</u>
	<u>Zone 2</u>	<u>Guadalupe</u>	<u>Washington</u>	<u>Rutherford</u>
<u>Zone 2</u>	<u>Belknap</u>	<u>Harding</u>	<u>Wyoming</u>	<u>Stokes</u>
<u>Antelope</u>	<u>Cheshire</u>	<u>Hidalgo</u>	<u>Yates</u>	<u>Surry</u>
<u>Banner</u>	<u>Coos</u>	<u>Lea</u>		<u>Swain</u>
<u>Box Butte</u>	<u>Grafton</u>	<u>Lincoln</u>	<u>Zone 2</u>	<u>Vance</u>
<u>Buffalo</u>	<u>Hillsborough</u>	<u>Los Alamos</u>	<u>Clinton</u>	<u>Wake</u>
<u>Chase</u>	<u>Merrimack</u>	<u>Luna</u>	<u>Jefferson</u>	<u>Warren</u>
<u>Cheyenne</u>	<u>Rockingham</u>	<u>McKinley</u>	<u>Lewis</u>	<u>Wilkes</u>
<u>Custer</u>	<u>Strafford</u>	<u>Otero</u>	<u>Monroe</u>	<u>Yadkin</u>
<u>Dawes</u>	<u>Sullivan</u>	<u>Quay</u>	<u>Montgomery</u>	<u>Yancey</u>
<u>Dawson</u>		<u>Roosevelt</u>	<u>Niagara</u>	
<u>Deuel</u>	NEW JERSEY	<u>San Juan</u>	<u>Oneida</u>	NORTH DAKOTA
<u>Dundy</u>	<u>Zone 1</u>	<u>Sandoval</u>	<u>Orleans</u>	<u>Zone 1</u>
<u>Hall</u>	<u>Hunterdon</u>	<u>Sierra</u>	<u>Oswego</u>	<u>Adams</u>
<u>Howard</u>	<u>Mercer</u>	<u>Socorro</u>	<u>Saratoga</u>	<u>Barnes</u>
<u>Keith</u>	<u>Monmouth</u>	<u>Torrance</u>	<u>Schenectady</u>	<u>Benson</u>
<u>Keya Paha</u>	<u>Morris</u>	<u>Union</u>	<u>St Lawrence</u>	<u>Billings</u>
<u>Kimball</u>	<u>Somerset</u>	<u>Valencia</u>	<u>Wayne</u>	<u>Bottineau</u>
<u>Merrick</u>	<u>Sussex</u>			<u>Bowman</u>
<u>Morrill</u>	<u>Warren</u>	NEW YORK	NORTH CAROLINA	<u>Burke</u>
<u>Perkins</u>		<u>Zone 1</u>	<u>Zone 1</u>	<u>Burleigh</u>
<u>Scotts Bluff</u>	<u>Zone 2</u>	<u>Albany</u>	<u>Alleghany</u>	<u>Cass</u>
<u>Sheridan</u>	<u>Bergen</u>	<u>Alleghany</u>	<u>Buncombe</u>	<u>Cavalier</u>
<u>Sherman</u>	<u>Burlington</u>	<u>Broome</u>	<u>Cherokee</u>	<u>Dickey</u>
<u>Sioux</u>	<u>Camden</u>	<u>Cattaraugus</u>	<u>Henderson</u>	<u>Divide</u>
<u>Valley</u>	<u>Cumberland</u>	<u>Cayuga</u>	<u>Mitchell</u>	<u>Dunn</u>
	<u>Essex</u>	<u>Chautauqua</u>	<u>Rockingham</u>	<u>Eddy</u>
NEVADA	<u>Gloucester</u>	<u>Chemung</u>	<u>Transylvania</u>	<u>Emmons</u>
<u>Zone 1</u>	<u>Hudson</u>	<u>Chenango</u>	<u>Watauga</u>	<u>Foster</u>
<u>Carson City</u>	<u>Middlesex</u>	<u>Columbia</u>		<u>Golden Valley</u>
<u>Douglas</u>	<u>Passaic</u>	<u>Cortland</u>	<u>Zone 2</u>	<u>Grand Forks</u>
<u>Eureka</u>	<u>Salem</u>	<u>Delaware</u>	<u>Alexander</u>	<u>Grant</u>
<u>Lander</u>	<u>Union</u>	<u>Dutchess</u>	<u>Ashe</u>	<u>Griggs</u>

<u>Lincoln</u>		<u>Erie</u>	<u>Avery</u>	<u>Hettinger</u>
<u>Lyon</u>	<u>NEW MEXICO</u>	<u>Genesee</u>	<u>Burke</u>	<u>Kidder</u>
<u>Mineral</u>	<u>Zone 1</u>	<u>Greene</u>	<u>Caldwell</u>	<u>LaMoure</u>
<u>Pershing</u>	<u>Bernalillo</u>	<u>Livingston</u>	<u>Caswell</u>	<u>Logan</u>
<u>White Pine</u>	<u>Colfax</u>	<u>Madison</u>	<u>Catawba</u>	<u>McHenry</u>
	<u>Mora</u>	<u>Onondaga</u>	<u>Clay</u>	<u>McIntosh</u>
<u>Zone 2</u>	<u>Rio Arriba</u>	<u>Ontario</u>	<u>Cleveland</u>	<u>McKenzie</u>
<u>Churchill</u>	<u>San Miguel</u>	<u>Orange</u>	<u>Forsyth</u>	<u>McLean</u>
<u>Elko</u>	<u>Santa Fe</u>	<u>Otsego</u>	<u>Franklin</u>	<u>Mercer</u>
<u>Morton</u>	<u>Huron</u>	<u>Morgan</u>	<u>Adams</u>	<u>Crawford</u>
<u>Mountrail</u>	<u>Jefferson</u>	<u>Noble</u>	<u>Allegheny</u>	<u>Elk</u>
<u>Nelson</u>	<u>Knox</u>	<u>Ottawa</u>	<u>Armstrong</u>	<u>Erie</u>
<u>Oliver</u>	<u>Licking</u>	<u>Paulding</u>	<u>Beaver</u>	<u>Fayette</u>
<u>Pembina</u>	<u>Logan</u>	<u>Portage</u>	<u>Bedford</u>	<u>Forest</u>
<u>Pierce</u>	<u>Madison</u>	<u>Putnam</u>	<u>Berks</u>	<u>Greene</u>
<u>Ramsey</u>	<u>Marion</u>	<u>Sandusky</u>	<u>Blair</u>	<u>Jefferson</u>
<u>Ransom</u>	<u>Mercer</u>	<u>Scioto</u>	<u>Bradford</u>	<u>Lawrence</u>
<u>Renville</u>	<u>Miami</u>	<u>Trumbull</u>	<u>Bucks</u>	<u>McKean</u>
<u>Richland</u>	<u>Montgomery</u>	<u>Vinton</u>	<u>Butler</u>	<u>Mercer</u>
<u>Rolette</u>	<u>Morrow</u>	<u>Washington</u>	<u>Cameron</u>	<u>Pike</u>
<u>Sargent</u>	<u>Muskingum</u>	<u>Williams</u>	<u>Carbon</u>	<u>Potter</u>
<u>Sheridan</u>	<u>Perry</u>	<u>Wood</u>	<u>Centre</u>	<u>Somerset</u>
<u>Sioux</u>	<u>Pickaway</u>		<u>Chester</u>	<u>Warren</u>
<u>Slope</u>	<u>Pike</u>	<u>OKLAHOMA</u>	<u>Clarion</u>	<u>Washington</u>
<u>Stark</u>	<u>Preble</u>	<u>Zone 2</u>	<u>Clearfield</u>	<u>Wayne</u>
<u>Steele</u>	<u>Richland</u>	<u>Adair</u>	<u>Clinton</u>	
<u>Stutsman</u>	<u>Ross</u>	<u>Beaver</u>	<u>Columbia</u>	<u>RHODE ISLAND</u>
<u>Towner</u>	<u>Seneca</u>	<u>Cherokee</u>	<u>Cumberland</u>	<u>Zone 1</u>
<u>Trall</u>	<u>Shelby</u>	<u>Cimarron</u>	<u>Dauphin</u>	<u>Kent</u>
<u>Walsh</u>	<u>Stark</u>	<u>Delaware</u>	<u>Delaware</u>	<u>Washington</u>
<u>Ward</u>	<u>Summit</u>	<u>Ellis</u>	<u>Franklin</u>	
<u>Wells</u>	<u>Tuscarawas</u>	<u>Mayes</u>	<u>Fulton</u>	<u>Zone 2</u>
<u>Williams</u>	<u>Union</u>	<u>Sequoyah</u>	<u>Huntingdon</u>	<u>Newport</u>
	<u>Van Wert</u>	<u>Texas</u>	<u>Indiana</u>	<u>Providence</u>
<u>OHIO</u>	<u>Warren</u>		<u>Juniata</u>	
<u>Zone 1</u>	<u>Wayne</u>	<u>OREGON</u>	<u>Lackawanna</u>	<u>SOUTH CAROLINA</u>
<u>Adams</u>	<u>Wyandot</u>	<u>Zone 2</u>	<u>Lancaster</u>	<u>Zone 1</u>
<u>Allen</u>		<u>Baker</u>	<u>Lebanon</u>	<u>Greenville</u>
<u>Ashland</u>	<u>Zone 2</u>	<u>Clatsop</u>	<u>Lehigh</u>	
<u>Auglaize</u>	<u>Ashtabula</u>	<u>Columbia</u>	<u>Luzerne</u>	<u>Zone 2</u>
<u>Belmont</u>	<u>Athens</u>	<u>Crook</u>	<u>Lycoming</u>	<u>Abbeville</u>
<u>Butler</u>	<u>Brown</u>	<u>Gilliam</u>	<u>Mifflin</u>	<u>Anderson</u>
<u>Carroll</u>	<u>Clermont</u>	<u>Grant</u>	<u>Monroe</u>	<u>Cherokee</u>
<u>Champaign</u>	<u>Cuyahoga</u>	<u>Harney</u>	<u>Montgomery</u>	<u>Laurens</u>
<u>Clark</u>	<u>Defiance</u>	<u>Hood River</u>	<u>Montour</u>	<u>Oconee</u>
<u>Clinton</u>	<u>Erie</u>	<u>Jefferson</u>	<u>Northampton</u>	<u>Pickens</u>

<u>Columbiana</u>	<u>Fulton</u>	<u>Klamath</u>	<u>Northumberland</u>	<u>Spartanburg</u>
<u>Coshocton</u>	<u>Gallia</u>	<u>Lake</u>	<u>Perry</u>	<u>York</u>
<u>Crawford</u>	<u>Geauga</u>	<u>Malheur</u>	<u>Schuylkill</u>	
<u>Darke</u>	<u>Henry</u>	<u>Morrow</u>	<u>Snyder</u>	<u>SOUTH DAKOTA</u>
<u>Delaware</u>	<u>Highland</u>	<u>Multnomah</u>	<u>Sullivan</u>	<u>Zone 1</u>
<u>Fairfield</u>	<u>Hocking</u>	<u>Sherman</u>	<u>Susquehanna</u>	<u>Aurora</u>
<u>Fayette</u>	<u>Jackson</u>	<u>Umatilla</u>	<u>Tioga</u>	<u>Beadle</u>
<u>Franklin</u>	<u>Lake</u>	<u>Union</u>	<u>Union</u>	<u>Bon Homme</u>
<u>Greene</u>	<u>Lawrence</u>	<u>Wasco</u>	<u>Venango</u>	<u>Brookings</u>
<u>Guernsey</u>	<u>Lorain</u>	<u>Washington</u>	<u>Westmoreland</u>	<u>Brown</u>
<u>Hamilton</u>	<u>Lucas</u>	<u>Wheeler</u>	<u>Wyoming</u>	<u>Brule</u>
<u>Hancock</u>	<u>Mahoning</u>	<u>Yamhill</u>	<u>York</u>	<u>Buffalo</u>
<u>Hardin</u>	<u>Medina</u>			<u>Campbell</u>
<u>Harrison</u>	<u>Meigs</u>	<u>PENNSYLVANIA</u>	<u>Zone 2</u>	<u>Charles Mix</u>
<u>Holmes</u>	<u>Monroe</u>	<u>Zone 1</u>	<u>Cambria</u>	<u>Clark</u>
<u>Clay</u>	<u>Mellette</u>	<u>Carter</u>	<u>Hutchinson</u>	<u>Wayne</u>
<u>Codington</u>	<u>Pennington</u>	<u>Cheatham</u>	<u>Jeff Davis</u>	<u>Weber</u>
<u>Corson</u>	<u>Shannon</u>	<u>Chester</u>	<u>Lamb</u>	
<u>Davison</u>	<u>Todd</u>	<u>Clay</u>	<u>Lipscomb</u>	<u>VERMONT</u>
<u>Day</u>	<u>Tripp</u>	<u>Cocke</u>	<u>Llano</u>	<u>Zone 2</u>
<u>Deuel</u>	<u>Ziebach</u>	<u>Coffee</u>	<u>Lubbock</u>	<u>Addison</u>
<u>Douglas</u>		<u>Decatur</u>	<u>Lynn</u>	<u>Bennington</u>
<u>Edmunds</u>	<u>TENNESSEE</u>	<u>DeKalb</u>	<u>Mason</u>	<u>Caledonia</u>
<u>Faulk</u>	<u>Zone 1</u>	<u>Dickson</u>	<u>Moore</u>	<u>Essex</u>
<u>Grant</u>	<u>Anderson</u>	<u>Fentress</u>	<u>Ochiltree</u>	<u>Franklin</u>
<u>Hamlin</u>	<u>Bedford</u>	<u>Hamilton</u>	<u>Oldham</u>	<u>Lamoille</u>
<u>Hand</u>	<u>Blount</u>	<u>Hardin</u>	<u>Parmer</u>	<u>Orange</u>
<u>Hanson</u>	<u>Bradley</u>	<u>Henderson</u>	<u>Potter</u>	<u>Orleans</u>
<u>Hughes</u>	<u>Claiborne</u>	<u>Houston</u>	<u>Presidio</u>	<u>Rutland</u>
<u>Hutchinson</u>	<u>Davidson</u>	<u>Johnson</u>	<u>Randall</u>	<u>Washington</u>
<u>Hyde</u>	<u>Giles</u>	<u>Marion</u>	<u>Reeves</u>	<u>Windham</u>
<u>Jerauld</u>	<u>Grainger</u>	<u>McNairy</u>	<u>Roberts</u>	<u>Windsor</u>
<u>Kingsbury</u>	<u>Greene</u>	<u>Montgomery</u>	<u>Sherman</u>	
<u>Lake</u>	<u>Hamblen</u>	<u>Overton</u>	<u>Swisher</u>	<u>VIRGINIA</u>
<u>Lincoln</u>	<u>Hancock</u>	<u>Pickett</u>	<u>Terrell</u>	<u>Zone 1</u>
<u>Lyman</u>	<u>Hawkins</u>	<u>Polk</u>		<u>Alleghany</u>
<u>Marshall</u>	<u>Hickman</u>	<u>Putnam</u>	<u>UTAH</u>	<u>Amelia</u>
<u>McCook</u>	<u>Humphreys</u>	<u>Robertson</u>	<u>Zone 1</u>	<u>Appomattox</u>
<u>McPherson</u>	<u>Jackson</u>	<u>Sevier</u>	<u>Carbon</u>	<u>Augusta</u>
<u>Miner</u>	<u>Jefferson</u>	<u>Stewart</u>	<u>Duchesne</u>	<u>Bath</u>
<u>Minnehaha</u>	<u>Knox</u>	<u>Sumner</u>	<u>Grand</u>	<u>Bland</u>
<u>Moody</u>	<u>Lawrence</u>	<u>Unicoi</u>	<u>Piute</u>	<u>Botetourt</u>
<u>Perkins</u>	<u>Lewis</u>	<u>Van Buren</u>	<u>Sanpete</u>	<u>Brunswick</u>
<u>Potter</u>	<u>Lincoln</u>	<u>Warren</u>	<u>Sevier</u>	<u>Buckingham</u>
<u>Roberts</u>	<u>Loudon</u>	<u>White</u>	<u>Uintah</u>	<u>Campbell</u>
<u>Sanborn</u>	<u>Macon</u>			<u>Chesterfield</u>

<u>Spink</u>	<u>Madison</u>	TEXAS	<u>Zone 2</u>	<u>Clarke</u>
<u>Stanley</u>	<u>Marshall</u>	<u>Zone 2</u>	<u>Beaver</u>	<u>Craig</u>
<u>Sully</u>	<u>McMinn</u>	<u>Armstrong</u>	<u>Box Elder</u>	<u>Cumberland</u>
<u>Turner</u>	<u>Meigs</u>	<u>Bailey</u>	<u>Cache</u>	<u>Dinwiddie</u>
<u>Union</u>	<u>Monroe</u>	<u>Brewster</u>	<u>Daggett</u>	<u>Fairfax</u>
<u>Walworth</u>	<u>Moore</u>	<u>Carson</u>	<u>Davis</u>	<u>Fluvanna</u>
<u>Yankton</u>	<u>Perry</u>	<u>Castro</u>	<u>Emery</u>	<u>Frederick</u>
	<u>Roane</u>	<u>Crosby</u>	<u>Garfield</u>	<u>Giles</u>
<u>Zone 2</u>	<u>Rutherford</u>	<u>Culberson</u>	<u>Iron</u>	<u>Goochland</u>
<u>Bennett</u>	<u>Smith</u>	<u>Dallam</u>	<u>Juab</u>	<u>Henry</u>
<u>Butte</u>	<u>Sullivan</u>	<u>Deaf Smith</u>	<u>Kane</u>	<u>Highland</u>
<u>Custer</u>	<u>Trousdale</u>	<u>Donley</u>	<u>Millard</u>	<u>Lee</u>
<u>Dewey</u>	<u>Union</u>	<u>Floyd</u>	<u>Morgan</u>	<u>Louisa</u>
<u>Fall River</u>	<u>Washington</u>	<u>Garza</u>	<u>Rich</u>	<u>Montgomery</u>
<u>Gregory</u>	<u>Wayne</u>	<u>Gray</u>	<u>Salt Lake</u>	<u>Nottoway</u>
<u>Haakon</u>	<u>Williamson</u>	<u>Hale</u>	<u>San Juan</u>	<u>Orange</u>
<u>Harding</u>	<u>Wilson</u>	<u>Hansford</u>	<u>Summit</u>	<u>Page</u>
<u>Jackson</u>		<u>Hartley</u>	<u>Tooele</u>	<u>Patrick</u>
<u>Jones</u>	<u>Zone 2</u>	<u>Hemphill</u>	<u>Utah</u>	<u>Pittsylvania</u>
<u>Lawrence</u>	<u>Benton</u>	<u>Hockley</u>	<u>Wasatch</u>	<u>Powhatan</u>
<u>Meade</u>	<u>Cannon</u>	<u>Hudspeth</u>	<u>Washington</u>	<u>Pulaski</u>
<u>Roanoke</u>	<u>Pend Oreille</u>	<u>Barbour</u>	<u>Marathon</u>	<u>Oneida</u>
<u>Rockbridge</u>	<u>Skamania</u>	<u>Braxton</u>	<u>Menominee</u>	<u>Outagamie</u>
<u>Rockingham</u>	<u>Spokane</u>	<u>Cabell</u>	<u>Pepin</u>	<u>Ozaukee</u>
<u>Russell</u>	<u>Stevens</u>	<u>Calhoun</u>	<u>Pierce</u>	<u>Polk</u>
<u>Scott</u>		<u>Clay</u>	<u>Portage</u>	<u>Price</u>
<u>Shenandoah</u>	<u>Zone 2</u>	<u>Doddridge</u>	<u>Richland</u>	<u>Racine</u>
<u>Smyth</u>	<u>Adams</u>	<u>Fayette</u>	<u>Rock</u>	<u>Rusk</u>
<u>Spotsylvania</u>	<u>Asotin</u>	<u>Gilmer</u>	<u>Shawano</u>	<u>Sauk</u>
<u>Stafford</u>	<u>Benton</u>	<u>Harrison</u>	<u>St Croix</u>	<u>Sawyer</u>
<u>Tazewell</u>	<u>Columbia</u>	<u>Jackson</u>	<u>Vernon</u>	<u>Sheboygan</u>
<u>Warren</u>	<u>Douglas</u>	<u>Lewis</u>	<u>Walworth</u>	<u>Taylor</u>
<u>Washington</u>	<u>Franklin</u>	<u>Lincoln</u>	<u>Washington</u>	<u>Trempealeau</u>
<u>Wythe</u>	<u>Garfield</u>	<u>Marion</u>	<u>Waukesha</u>	<u>Vilas</u>
	<u>Grant</u>	<u>Mason</u>	<u>Waupaca</u>	<u>Washburn</u>
<u>Zone 2</u>	<u>Kittitas</u>	<u>Nicholas</u>	<u>Wood</u>	<u>Waushara</u>
<u>Albemarle</u>	<u>Klickitat</u>	<u>Pleasants</u>		<u>Winnebago</u>
<u>Amherst</u>	<u>Lincoln</u>	<u>Putnam</u>	<u>Zone 2</u>	
<u>Arlington</u>	<u>Walla Walla</u>	<u>Raleigh</u>	<u>Adams</u>	WYOMING
<u>Bedford</u>	<u>Whitman</u>	<u>Randolph</u>	<u>Ashland</u>	<u>Zone 1</u>
<u>Buchanan</u>	<u>Yakima</u>	<u>Ritchie</u>	<u>Barron</u>	<u>Albany</u>
<u>Carroll</u>		<u>Roane</u>	<u>Bayfield</u>	<u>Big Horn</u>
<u>Charlotte</u>	WEST VIRGINIA	<u>Taylor</u>	<u>Brown</u>	<u>Campbell</u>
<u>Culpeper</u>	<u>Zone 1</u>	<u>Tucker</u>	<u>Burnett</u>	<u>Carbon</u>
<u>Dickenson</u>	<u>Berkeley</u>	<u>Tyler</u>	<u>Calumet</u>	<u>Converse</u>
<u>Fauquier</u>	<u>Brooke</u>	<u>Upshur</u>	<u>Chippewa</u>	<u>Crook</u>

<u>Floyd</u>	<u>Grant</u>	<u>Wayne</u>	<u>Clark</u>	<u>Fremont</u>
<u>Franklin</u>	<u>Greenbrier</u>	<u>Webster</u>	<u>Columbia</u>	<u>Goshen</u>
<u>Grayson</u>	<u>Hampshire</u>	<u>Wirt</u>	<u>Douglas</u>	<u>Hot Springs</u>
<u>Greene</u>	<u>Hancock</u>	<u>Wood</u>	<u>Dunn</u>	<u>Johnson</u>
<u>Halifax</u>	<u>Hardy</u>		<u>Eau Claire</u>	<u>Laramie</u>
<u>Loudoun</u>	<u>Jefferson</u>	<u>WISCONSIN</u>	<u>Florence</u>	<u>Lincoln</u>
<u>Lunenburg</u>	<u>Marshall</u>	<u>Zone 1</u>	<u>Forest</u>	<u>Natrona</u>
<u>Madison</u>	<u>Mercer</u>	<u>Buffalo</u>	<u>Iron</u>	<u>Niobrara</u>
<u>Mecklenburg</u>	<u>Mineral</u>	<u>Crawford</u>	<u>Jackson</u>	<u>Park</u>
<u>Nelson</u>	<u>Monongalia</u>	<u>Dane</u>	<u>Juneau</u>	<u>Sheridan</u>
<u>Prince Edward</u>	<u>Monroe</u>	<u>Dodge</u>	<u>Kenosha</u>	<u>Sublette</u>
<u>Prince William</u>	<u>Morgan</u>	<u>Door</u>	<u>Kewaunee</u>	<u>Sweetwater</u>
<u>Rappahannock</u>	<u>Ohio</u>	<u>Fond du Lac</u>	<u>La Crosse</u>	<u>Teton</u>
<u>Wise</u>	<u>Pendleton</u>	<u>Grant</u>	<u>Lincoln</u>	<u>Uinta</u>
	<u>Pocahontas</u>	<u>Green</u>	<u>Manitowoc</u>	<u>Washakie</u>
<u>WASHINGTON</u>	<u>Preston</u>	<u>Green Lake</u>	<u>Marinette</u>	
<u>Zone 1</u>	<u>Summers</u>	<u>Iowa</u>	<u>Marquette</u>	<u>Zone 2</u>
<u>Clark</u>	<u>Wetzel</u>	<u>Jefferson</u>	<u>Milwaukee</u>	<u>Platte</u>
<u>Ferry</u>		<u>Lafayette</u>	<u>Monroe</u>	<u>Weston</u>
<u>Okanogan</u>	<u>Zone 2</u>	<u>Langlade</u>	<u>Oconto</u>	

EPA Map of Radon Zones

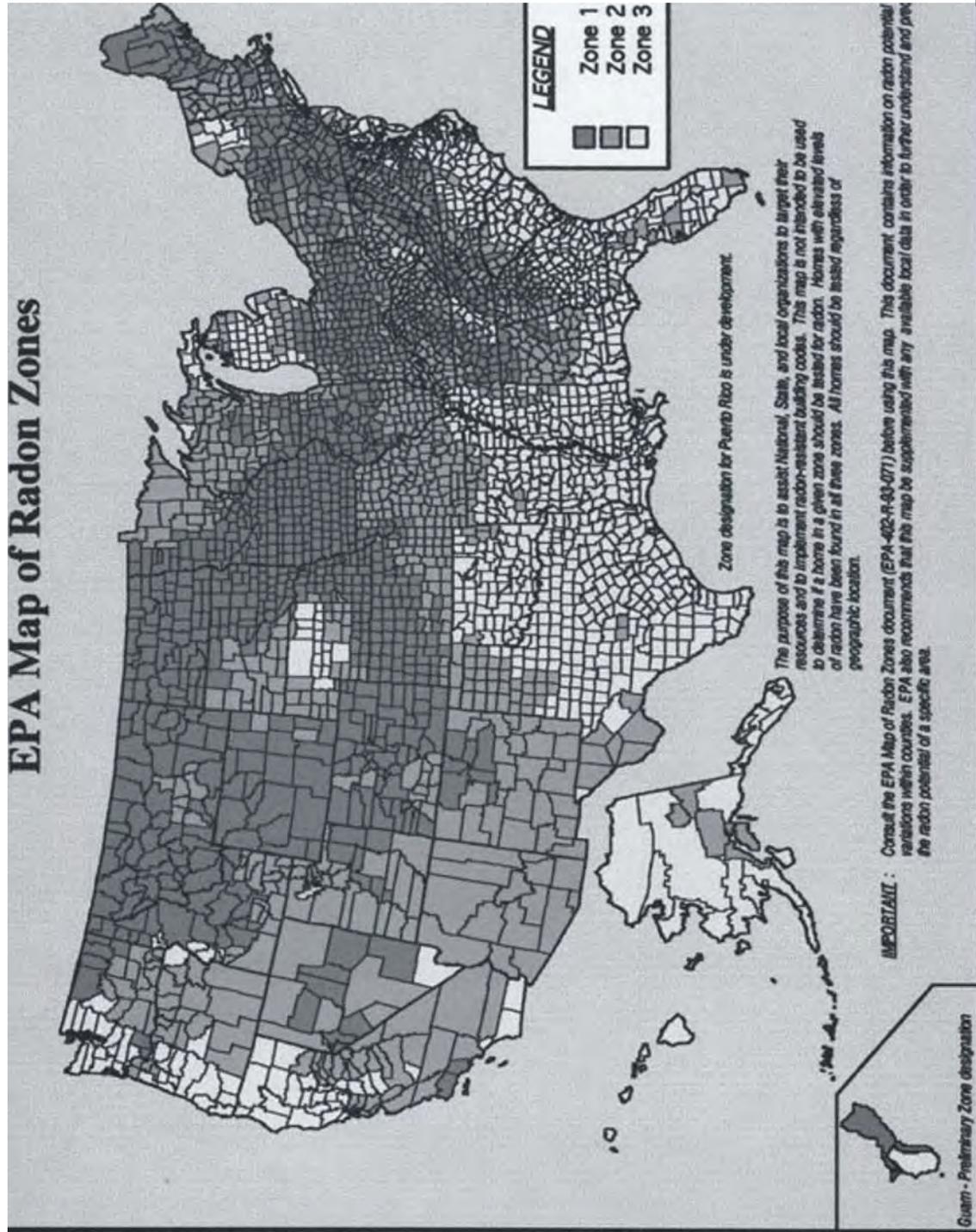


FIGURE 804.3

Add new definitions as follows:

**SECTION 202
DEFINITIONS**

RADON. A naturally occurring, chemically inert, radioactive element (Rn-222) that exists as a gas.

QUALIFIED. A designation applied to individuals or companies that have met the qualification requirements of the National Radon Proficiency Program or the National Radon Safety Board or that have been authorized by the state government to provide *radon* laboratory, measurement or mitigation services.

Reason: Radon is a Class A carcinogen, known to cause cancer in humans and is responsible for the deaths of 21,000 Americans each year from radon-induced lung cancer. Radon testing is the only way to detect the presence of the gas and steps can be taken to reduce indoor radon levels.

Cost Impact: Will increase the cost of construction. This change proposal will slightly increase the cost of construction by adding radon testing. Cost of radon test =\$125. (1) radon test required per dwelling or every 2,000 sq feet of ground contact building space. The cost savings for reduced health care resulting from a healthier indoor environment has not been calculated.

GG235-14 : 804.3 (NEW)-KAPUROWSKI758

GG236-14

804.3 (New)

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)

Add new text as follows:

804.3 Carbon monoxide detectors. Buildings that contain one or more gas, liquid or solid fuel-fired appliances shall be provided with one or more carbon monoxide detectors located in each occupied story. Carbon monoxide detectors shall be installed in accordance with the requirements of NFPA 720.

Add new standard(s) as follows:

NFPA

720-2015 Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment

Reason: There are many environmental and safety reasons to install CO detectors in buildings with fossil fuel or wood burning appliances. The following is information from the US Consumer Product Safety Commission <http://www.cpsc.gov/en/Safety-Education/Safety-Education-Centers/Carbon-Monoxide-Information-Center/Carbon-Monoxide-Questions-and-Answers/>

"Carbon monoxide (CO) is a deadly, colorless, odorless, poisonous gas. It is produced by the incomplete burning of various fuels, including coal, wood, charcoal, oil, kerosene, propane, and natural gas."

"On average, about 170 people in the United States die every year from CO produced by non-automotive consumer products. These products include malfunctioning fuel-burning appliances such as furnaces, ranges, water heaters and room heaters; engine-powered equipment such as portable generators; fireplaces; and charcoal that is burned in homes and other enclosed areas."

Carbon monoxide detection technology has been used for many years and is widely available.

The NFPA standard is referenced as it covers aspects from selection to design to performance and maintenance, as shown in the scope:

"NFPA 720: Document Scope

1.1* Scope. 1.1.1 This standard is primarily concerned with life safety, not with protection of property. 1.1.2* This standard covers the selection, design, application, installation, location, performance, inspection, testing, and maintenance of carbon monoxide detection and warning equipment in buildings and structures. 1.1.3 This standard contains requirements for the selection, installation, operation, and maintenance of equipment that detects concentrations of carbon monoxide that could pose a life safety risk to most occupants in buildings and structures."

Cost Impact: Will increase the cost of construction.

Analysis: The standard NFPA 720 is referenced by one or more 2012 I-codes.

GG236-14 : 804.3 (NEW)-ROSENSTOCK514

GG237-14

806.1

Proponent: Stephany Mason, Eurofins Air Toxics, Inc., representing Eurofins Scientific (stephanymason@eurofinsus.com)

Revise as follows:

806.1 Emissions from composite wood products. Composite wood products used interior to the *approved* weather covering of the building shall comply with the emission limits or be manufactured in accordance with the standards cited in Table 806.1. Compliance with emission limits shall be demonstrated following the requirements of Section 93120 of Title 17 of the California Code of Regulations.

Exceptions:

1. Composite wood products that are made using adhesives that do not contain urea-formaldehyde (UF) resins.
2. Composite wood products that are sealed with an impermeable material on all sides and edges.
3. Composite wood products that are used to make elements considered to be furniture, fixtures and equipment (FF&E) that are not permanently installed.
4. Materials that do not exceed 50 percent of the formaldehyde limit of European formaldehyde class E1 in accordance with EN 13986.

Add new standard(s) as follows:

British Standards Institution
389 Chiswick High Road
London
W4 4AL
United Kingdom

EN 13986 – 2004 Wood-Based Panels for Use in Construction, Characteristics, Evaluation of Conformity and Marking

Reason: This allows selection of products and materials that fall under European law rather than North American regulations. As the IgCC is an international code, this is particularly important if the code is applied outside North America.

Further, the test method used for this exception, EN 717-2, is already accepted by CARB ATCM. This exception still ensures that the limits in Section 806.1 are met.

Cost Impact: Will not increase the cost of construction. This change should result in cost decreases, particularly outside of North America.

Analysis: A review of the standard proposed for inclusion in the code, EN 13986 – 2004 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG237-14 : 806.1-MASON730

GG238-14

806.1

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

Revise as follows:

806.1 Emissions from composite wood products. Composite wood products used interior to the *approved* weather covering of the building shall comply with the emission limits ~~or be manufactured in accordance with the standards cited~~ in Table 806.1. Compliance with emission limits shall be demonstrated following the requirements of Section 93120 of Title 17 of the California Code of Regulations.

Exceptions:

1. Composite wood products that are made using adhesives that do not contain urea-formaldehyde (UF) resins.
2. Composite wood products that are sealed with an impermeable material on all sides and edges.
3. Composite wood products that are used to make elements considered to be furniture, fixtures and equipment (FF&E) that are not permanently installed.

**TABLE 806.1
COMPOSITE PRODUCTS EMISSIONS**

PRODUCT	FORMALDEHYDE LIMIT ^b (ppm)	STANDARD
Hardwood plywood	0.05	—
Particle board	0.09	—
Medium-density fiberboard	0.11	—
Thin medium-density fiberboard ^a	0.13	—

a. Maximum thickness of 5/16 inch (8 mm)

b. Phase 2 Formaldehyde Emissions Standards, Table 1, Section 93120, Title 17, California Code of Regulations; compliance shall be demonstrated in accordance with ASTM E 1333 or ASTM D 6007.

Reason: The intent of this proposal is to delete unnecessary and confusing text from the IgCC.

As currently written, Section 806.1 gives two options regarding emissions from composite wood products—either comply with the emission limits in Table 806.1, or demonstrate the products are manufactured in accordance with the standards listed in the same table. However, no standards are listed in Table 806.1. This proposal removes the reference in the text to the non-existent standards in the table, and deletes the column from the table.

Cost Impact: Will not increase the cost of construction. This is an editorial change, which does not change how wood composite products are regulated by the IgCC.

GG238-14 : 806.1-SIU1183

GG239-14

806.2, 806.3

Proponent: Stephany Mason, Eurofins Air Toxics, Inc., representing Eurofins Scientific (stephanymason@eurofinsus.com)

Revise as follows:

806.2 Adhesives and sealants. A minimum of 85 percent by weight or volume, of specific categories of site-applied adhesives and sealants used on the interior side of the building envelope shall comply with the VOC content limits in Table 806.2(1) or alternative VOC emission limits in Table 806.2(2). The VOC content shall be determined in accordance with the appropriate standard being either U.S. EPA Method 24, or SCAQMD Method 304, 316A or 316B, or ISO 11890-1 and 11890-2. The exempt compound content shall be determined by either SCAQMD Methods 302 and 303, or ASTM D 3960 or ISO 11890-2. Table 806.2(1) adhesives and sealants regulatory category and VOC content compliance determination shall conform to the SCAQMD Rule 1168. The provisions of this section shall not apply to adhesives and sealants that are subject to other applicable state or federal consumer product VOC regulations. HVAC duct sealants shall be classified as "Other" category within the SCAQMD Rule 1168 sealants table.

Exception: HVAC air duct sealants are not required to meet the emissions or the VOC content requirements when the air temperature in which they are applied is less than 40°F (4.5°C).

Table 806.2(2) adhesive alternative emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method V.1.1. The alternative emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

806.3 Architectural paints and coatings. A minimum of 85 percent by weight or volume, of site-applied interior architectural coatings shall comply with VOC content limits in Table 806.3(1) or the European Decopaint Directive (2004/42/EC), the Canadian VOC Concentration Limits for Architectural Coatings, the Hong Kong Air Pollution Control (VOC) Regulation, or the alternate emissions limits in Table 806.3(2). The exempt compound content shall be determined by ASTM D 3960 or ISO 11890-2.

Table 806.3(2) architectural coating alternate emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method V.1.1. The alternative emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Add new standard(s) as follows:

Environment Canada
10 Wellington, 23rd Floor
Gatineau QC K1A 0H3

SOR/2009-264 Canadian VOC Concentration Limits for Architectural Coatings

Environmental Protection Department of Hong Kong
15/F & 16/F, East Wing, Central Government Offices
2 Tim Mei Avenue
Tamar, Hong Kong

CAP 311 W - JAN 4, 2007 Hong Kong Air Pollution Control (VOC) Regulation (with revisions through JAN 1, 2010)

European Commission
Europe House
32 Smith Square
London SW1P 3EU

2004/42/EC European Decopaint Directive

ISO

11890-1:2007 Paints and varnishes -- Determination of volatile organic compound (VOC) content -- Part 1: Difference method

11890-2:2012 Paints and varnishes -- Determination of volatile organic compound (VOC) content -- Part 2: Gas-chromatographic method

Reason: This allows for selection of products and materials that fall under national laws other than those of the US. This is important especially if this international code is to be applied outside of the US.

These revisions are comparable to the new USGBC LEED v4 "Low-emitting materials" credit as it relates to VOC content requirements.

Bibliography:

European Decopaint Directive (http://ec.europa.eu/environment/air/pollutants/stationary/paints/paints_legis.htm)

Canadian VOC Concentration Limits for Architectural

Coatings (<http://ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=117>)

Hong Kong Air Pollution Control Regulation (http://epd.gov.hk/epd/english/environmentinhk/air/air_maincontent.html)

Cost Impact: Will not increase the cost of construction these changes should result in decreased building costs.

Analysis: A review of the standards proposed for inclusion in the code, ISO 11890-1 (2007), ISO 11890-2 (2013), European Decopaint Directive, Canadian VOC Concentration Limits for Architectural Coatings and Hong Kong Air Pollution Control Regulation with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG239-14 : 806.2 #1-MASON775

GG240-14

806.2, 806.3, 806.4, 806.5, 806.6, 806.7(New), 806.8(New)

Proponent: Stephany Mason, Eurofins Air Toxics, Inc., representing Eurofins Scientific (stephanymason@eurofinsus.com)

Revise as follows:

806.2 Adhesives and sealants. A minimum of 85 percent by weight or volume, of specific categories of site-applied adhesives and sealants used on the interior side of the building envelope shall comply with the VOC content limits in Table 806.2(1) or alternative VOC emission limits in Table 806.2(2). The VOC content shall be determined in accordance with the appropriate standard being either U.S. EPA Method 24 or SCAQMD Method 304, 316A or 316B. The exempt compound content shall be determined by either SCAQMD Methods 302 and 303 or ASTM D 3960. Table 806.2(1) adhesives and sealants regulatory category and VOC content compliance determination shall conform to the SCAQMD Rule 1168. The provisions of this section shall not apply to adhesives and sealants subject to state or federal consumer product VOC regulations. HVAC duct sealants shall be classified as "Other" category within the SCAQMD Rule 1168 sealants table.

Exception: HVAC air duct sealants are not required to meet the emissions or the VOC content requirements when the air temperature in which they are applied is less than 40°F (4.5°C).

Table 806.2(2) adhesive alternative emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method V.1.1. The ~~alternative~~ emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Exceptions:

1. Products tested in accordance with Section 806.7.
2. Products complying with the emissions requirements in Section 806.8.

806.3 Architectural paints and coatings. A minimum of 85 percent by weight or volume, of site-applied interior architectural coatings shall comply with VOC content limits in Table 806.3(1) or the alternate emissions limits in Table 806.3(2). The exempt compound content shall be determined by ASTM D 3960.

Table 806.3(2) architectural coating alternate emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method V.1.1. The ~~alternative~~ emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Exceptions:

1. Products tested in accordance with Section 806.7.
2. Products complying with the emissions requirements in Section 806.8.

806.4 Flooring. A minimum of 85 percent of the total area of flooring installed within the interior of the building shall comply with the requirements of Table 806.4(2). Where flooring with more than one distinct product layer is installed, the emissions from each layer shall comply with these requirements. The test methodology used to determine compliance shall be from CDPH/EHLB/Standard Method V.1.1. The ~~alternative~~ emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Where post-manufacture coatings or surface applications have not been applied, the flooring listed in Table 806.4(1) shall be deemed to comply with the requirements of Table 806.4(2).

Exceptions:

1. Products tested in accordance with Section 806.7.
2. Products complying with the emissions requirements in Section 806.8.

Revise as follows:

806.5 Acoustical ceiling tiles and wall systems. A minimum of 85 percent of acoustical ceiling tiles and wall systems, by square feet, shall comply with the requirements of Table 806.5(2). Where ceiling and wall systems with more than one distinct product layer are installed, the emissions from each layer shall comply with these requirements. The test methodology used to determine compliance shall be from CDPH/EHLB/ Standard Method V.1.1. The ~~alternative~~ emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Where post-manufacture coatings or surface applications have not been applied, the ceiling or wall systems listed in Table 806.5(1) shall be deemed to comply with the requirements of Table 806.5(2).

Exceptions:

1. Products tested in accordance with Section 806.7.
2. Products complying with the emissions requirements in Section 806.8.

806.6 Insulation. A minimum of 85 percent of insulation shall comply with the requirements of Table 806.6(1) or Table 808.6(2). The test methodology used to determine compliance shall be from CDPH/EHLB/Standard Method V.1.1. The ~~alternative~~ emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Exceptions:

1. Products tested in accordance with Section 806.7.
2. Products complying with the emissions requirements in Section 806.8.

Add new text as follows:

806.7 (New) Alternative emissions test methods. Products tested in accordance with the any one of the following standards shall be considered to be in compliance with Sections 806.2 through 806.6, as applicable.

1. German AgBB Testing and Evaluation Scheme
2. ISO 16000-3, ISO 16000-6, ISO 16000-9 or ISO 16000-11 in conjunction with the France Decree No. 2011-321
3. DIBt Testing Method
4. BS PD CEN/TS 16506.

The testing shall be performed by a laboratory that uses test methodology in the scope of its ISO 17025 accreditation.

806.8 (New) Alternative emissions test criteria. Tested products that comply with the German AgBB Testing and Evaluation Scheme emissions limits and a formaldehyde limit of 10 µg/m³ within 28 days shall be considered to be in compliance with Sections 806.2 through 806.6, as applicable.

Add new standard(s) as follows:

British Standards
Institution Post 389 Chiswick High Road London W4 4AL
United Kingdom

PD CEN/TS 16516:2013 Construction products. Assessment of release of dangerous substances. Determination of emissions into indoor air.

Deutsches Institut Fur Bautechnik (DIBT) Kolonnenstr.
30 B
10829 Berlin
Germany

DIBT Testing Method (2010) Principles for the Health Assessment of Indoor Construction as of October 2010

Secrétariat général du Gouvernement
Hôtel de Matignon
57, rue de Varenne
75007 PARIS FRANCE

France Decree No. 2011-321 of 23 March 2011 Labeling of construction or wall cladding or flooring and paint and varnish on their emissions of volatile pollutants

Committee for Health-related Evaluation of Building Products (German AgBB)
IHCP Communication Office European Commission
Joint Research Centre Institute for Health and Consumer Protection
Via E. Fermi 2749
21027 Ispra (Varese) Italy

German AgBB Testing and Evaluation Scheme (2012) Health-related Evaluation Procedure for Volatile Organic compounds Emissions (VOC and SVOC) from Building Products

ISO

16000-3:2011- Indoor air -- Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air -- Active sampling method

16000-6:2011- Indoor air -- Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID

16000-9:2006- Indoor air -- Part 7: Determination of the emission of volatile organic compounds from building products and furnishing. Emission test chamber method

16000-11:2006- Indoor air -- Part 11: Determination of the emission of volatile organic compounds from building products and furnishing -- Sampling, storage of samples and preparation of test specimens

Reason: This allows for selection of products and materials that fall under national laws other than those of the US. This is important especially if this international code is to be applied outside of the US.

These revisions are comparable to the new USGBC LEED v4 "Low-emitting materials" credit as it relates to VOC emissions requirements.

France Decree No. 2011-321 of 23 March 2011 Labeling of construction or wall cladding or flooring and paint and varnish on their emissions of volatile pollutants

http://www.legifrance.org/affichTexteArticle.do;jsessionid=52319B77E0156A5E291B08783186970F.tpdjo04v_3?cidTexte=JORFTEXT000023759679&idArticle=LEGIARTI000023760175&dateTexte=20110325&categorieLien=cid#LEGIARTI000023760175

German AgBB Testing and Evaluation Scheme (2012) Health-related Evaluation Procedure for Volatile Organic Compounds Emissions (VOC and SVOC) from Building Products, 2012

http://www.umweltbundesamt.de/sites/default/files/medien/377/dokumente/agbb_evaluation_scheme_2012.pdf

DIBT Testing Method (2010) Principles for the Health Assessment of Indoor Construction as of October 2010

https://www.dibt.de/en/Divisions/data/Aktuelles_Ref_II_4_6.pdf

Cost Impact: Will not increase the cost of construction. The proposed change should decrease the cost of building.

Analysis: A review of the standards proposed for inclusion in the code, BS PD CEN/TS 16516:2013, DIBT Testing Method (2010), France Decree No. 2011-321 of 23 March 2011, German AgBB Testing and Evaluation Scheme (2013), ISO 16000-3:2011, 16000-6:2011, 16000-9:2006 and 16000-11:2006 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GG240-14 : 806.2 #2-MASON792

GG241-14

806.3, 806.5

Proponent: Lorraine Ross, representing Intech Consulting Inc representing The Dow Chemical Company (Intech@tampabay.rr.com)

Revise as follows:

806.3 Architectural paints and coatings. A minimum of 85 percent by weight or volume, of site-applied interior architectural coatings shall comply with VOC content limits in Table 806.3(1) or the alternate emissions limits in Table 806.3(2). The exempt compound content shall be determined by ASTM D 3960.

Table 806.3(2) architectural coating alternate emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method V.1.1. The alternative emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Exception: Architectural paints and coatings that are formulated to remove formaldehyde and other aldehydes in indoor air and are tested and labeled in accordance with ISO 16000-23.

806.5 Acoustical ceiling tiles and wall systems. A minimum of 85 percent of acoustical ceiling tiles and wall systems, by square feet, shall comply with the requirements of Table 806.5(2). Where ceiling and wall systems with more than one distinct product layer are installed, the emissions from each layer shall comply with these requirements. The test methodology used to determine compliance shall be from CDPH/EHLB/Standard Method V.1.1. The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Where post-manufacture coatings or surface applications have not been applied, the ceiling or wall systems listed in Table 806.5(1) shall be deemed to comply with the requirements of Table 806.5(2).

Exception: Acoustical ceilings and wall systems that are formulated to remove formaldehyde and other aldehydes in indoor air and are tested and labeled in accordance with ISO 16000-23.

Add new standard(s) as follows:

ISO

16000-23 - 2009 Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials

Reason: This proposal recognizes new technology for additives that have proven to abate, or remove, formaldehyde and other aldehydes when part of formulations for paints, coatings, acoustical ceilings and wall systems. The new proposed reference standard is the standard method used to assess the performance of these formulations.

For these categories of products, an exception from emission limits is granted as long as the abatement features are demonstrated by testing in accordance with the ISO standard:

ISO 16000-23 – 2009 Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials

Cost Impact: Will not increase the cost of construction. This proposal offers an alternative way to improve the indoor air environment.

Analysis: A review of the standard proposed for inclusion in the code, ISO 16000-23 – 2009 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG241-14 : 806.3-ROSS1144

GG242-14

806.6, 806.6.1 (New), 806.6.2 (New)

Proponent: Laura Bartels, GreenWeaver Inc. , representing GreenWeaver Inc.; David Eisenberg, Development Center for Appropriate Technology, representing Development Center for Appropriate Technology (strawnet@gmail.com); Dennis Murphy, representing USGBC California (dennis@usgbc-california.org); Megan Koehler (koehler@kmd-arch.com); Marjorie Smith, Siegel & Strain Architects, representing Siegel & Strain Architects (Msmith@siegelstrain.com); Suzanne Drake, Perkins+Will, representing Perkins+Will; Arlene Blum, representing Green Science Policy Institute; Vytenis Babrauskas, representing Fire Science and Technology Inc. (vytob@doctorfire.com); Bill Walsh, representing Healthy Building Network (bill@healthybuilding.net); Richard Graves, International Living Future Institute, representing International Living Future Institute; Tony Stefani, representing San Francisco Firefighters Cancer Prevention Foundation (stefanit@sbcglobal.net); Kirk Teske, HKS, Inc., representing HKS, Inc.

Revise as follows:

806.6 Insulation. ~~Insulation shall comply with Section 806.6.1 and 806.6.2. A minimum of 85 percent of insulation shall comply with the requirements of Table 806.6(1) or Table 808.6(2). The test methodology used to determine compliance shall be from CDPH/EHLB/Standard Method V.1.1, Standard Method for Testing VOC Emissions From Indoor Sources, dated February 2010. The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.~~

Add new text as follows:

806.6.1 VOC emissions. A minimum of 85 percent of insulation shall comply with the requirements of Table 806.6(1) or Table 806.6(2). The test methodology used to determine compliance shall be from CDPH/EHLB/Standard Method V.1.1. The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

806.6.2 Halogenated flame retardants. A minimum of 50 percent by volume of insulation shall not contain halogenated flame retardants.

Reason: All foam plastic insulation available in the U.S. today contains halogenated flame retardants (HFRs). Because of growing awareness and concerns about known and suspected human health and environmental impacts, HFRs are increasingly included on lists of chemicals to be excluded or reduced in built projects. These lists include those developed by leading national and international architecture and engineering firms, green rating and certification programs, building owners, and other groups and organizations.

There are many alternative insulation materials without halogenated flame retardants currently available on the market. However, because there are applications for which foam plastic insulation provides certain preferred or needed performance characteristics, limiting the percentage of insulation containing HFRs allows their use where needed or preferred while reducing the potential hazards associated with HFRs overall by encouraging the use of insulating materials that do not contain these chemicals.

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Links to the above research reports, and other supporting documentation are available for viewing and download at: <http://saferinsulation.org/bibliography/>.

Cost Impact: Will not increase the cost of construction.

GG242-14 : 806.6-BARTELS421

GG243-14
806.7 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

806.7 (New) Carpets. Carpets shall comply with the limits for volatile organic compound emissions in accordance with Tables 806.7(1) and 806.7(2). Testing shall be in accordance with ASTM D5116.

TABLE 806.7 (1)
CARPET 14-DAY VOC EMISSIONS TEST CRITERIA

<u>Volatile Organic Compound</u>	<u>Chemical Abstract Service #</u>	<u>Maximum Emission Factor (µgm²/hr)</u>
<u>Acetaldehyde</u>	<u>75-07-0</u>	<u>130</u>
<u>Benzene</u>	<u>71-43-2</u>	<u>55</u>
<u>Carbon disulfide</u>	<u>75-15-0</u>	<u>744</u>
<u>Carbon tetrachloride</u>	<u>56-23-5</u>	<u>37</u>
<u>Chlorobenzene</u>	<u>108-90-7</u>	<u>930</u>
<u>Chloroform</u>	<u>67-66-3</u>	<u>279</u>
<u>Dichlorobenzene (1,4-)</u>	<u>106-46-7</u>	<u>744</u>
<u>Dichloroethylene (1,1)</u>	<u>75-35-4</u>	<u>65</u>
<u>Dimethylformamide (N,N-)</u>	<u>68-12-2</u>	<u>74</u>
<u>Dioxane (1,4-)</u>	<u>123-91-1</u>	<u>2790</u>
<u>Epichlorohydrin</u>	<u>106-89-8</u>	<u>2</u>
<u>Ethylbenzene</u>	<u>100-41-4</u>	<u>1860</u>
<u>Ethylene glycol</u>	<u>107-21-1</u>	<u>372</u>
<u>Ethylene glycol monoethyl ether</u>	<u>110-80-5</u>	<u>65</u>
<u>Ethylene glycol monoethyl ether acetate</u>	<u>111-15-9</u>	<u>279</u>
<u>Ethylene glycol monomethyl ether</u>	<u>109-86-4</u>	<u>55</u>
<u>Ethylene glycol monomethyl ether acetate</u>	<u>110-49-6</u>	<u>83</u>
<u>Formaldehyde</u>	<u>50-00-0</u>	<u>16.7</u>
<u>Hexane (n-)</u>	<u>110-54-3</u>	<u>6510</u>
<u>Isophorone</u>	<u>78-59-1</u>	<u>1860</u>
<u>Isopropanol</u>	<u>67-63-0</u>	<u>6510</u>
<u>Methyl chloroform</u>	<u>71-55-6</u>	<u>930</u>
<u>Methylene chloride</u>	<u>75-09-2</u>	<u>372</u>
<u>Methyl t-butyl ether</u>	<u>1634-04-4</u>	<u>7440</u>

<u>Naphthalene</u>	<u>91-20-3</u>	<u>8.2</u>
<u>Phenol</u>	<u>108-95-2</u>	<u>186</u>
<u>Propylene glycol monomethyl ether</u>	<u>107-98-2</u>	<u>6510</u>
<u>Styrene</u>	<u>100-42-5</u>	<u>410</u>
<u>Tetrachloroethylene</u>	<u>127-18-4</u>	<u>32</u>
<u>Toluene</u>	<u>108-88-3</u>	<u>280</u>
<u>Trichloroethylene</u>	<u>79-01-6</u>	<u>558</u>
<u>Vinyl acetate</u>	<u>108-05-4</u>	<u>186</u>
<u>Xylenes, technical mixture (m-,o-, p- xylene combined)</u>	<u>108-38-3 95-47-6 106-42-3</u>	<u>651</u>

TABLE 806.7 (2)
CARPET CUSHION 24-HOUR VOC EMISSIONS TEST CRITERIA

<u>Volatile Organic Compound</u>	<u>24-hour Testing Period: Maximum Emission Factor (µg/m² per hour)</u>
<u>Butylated hydroxytoluene</u>	<u>300</u>
<u>Formaldehyde</u>	<u>50</u>
<u>4-Phenylcyclohexene (4PCH)</u>	<u>50</u>
<u>Total Volatile Organic Compounds</u>	<u>1000</u>

Add new standard(s) as follows:

ASTM

D5116 - 10 Standard Guides for Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products

Reason: Limiting levels of volatile organic compounds (VOCs) in carpet, carpet cushions, and carpet adhesives will reduce human exposure to VOCs and the associated health effects. VOCs are common chemical contaminants that can easily evaporate into the air and are found in homes and offices. Some VOCs are known carcinogens. Others can cause eye, nose, and throat irritation; headaches, fatigue, loss of coordination, dizziness, and nausea; and damage to the liver, kidney, and the central nervous system. Reducing VOCs in carpeting will help avoid these effects. New York City established a similar regulation in 2012.

Bibliography:

NYC Green Codes Task Force, Health and Toxicity Proposal 1 ([Proposal](#)) NYC Local Law 2 of 2012 ([Law](#); [Legis. Summary](#))
NYC Administrative Code 17-1401 through 17-1410 ([Code reference](#))

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, ASTM D5116-10 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG243-14 : 806.7 (NEW)-SCHEIB1143

GG244-14

806.7 (New), 806.7.1 (New), 806.7.2 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

806.7 Mold resistant board. Board used for walls shall be resistant to mold in accordance with Sections 806.7.1 and 806.7.2.

806.7.1 Cement board. The base for wall tile and wall panels in shower and bath surrounds for a height up to 70 inches (1778 mm) above the drain inlet, shall be composed of cement board, fiber-cement or glass mat gypsum backers in compliance with ASTM C1178, C1288, or C1325 and installed in accordance with manufacturer recommendations. Gypsum board shall not be used in such locations.

806.7.2 Mold resistance. Gypsum board or cement board shall have a mold resistant rating of not less than 10 in accordance with ASTM D3273 in all of the following locations:

1. Walls of basements and other below grade rooms.
2. Walls of mechanical rooms and closets housing air conditioning equipment.
3. Rear walls of fan coil or unit ventilator type HVAC unit chases.
4. Ceilings beneath cold water pipes.
5. Ceilings beneath air handlers in ceiling plenums.
6. Ceilings in bathrooms that do not contain a shower area.
7. Walls of plumbing chases.
8. Walls of laundry rooms.
9. Walls beneath kitchen sinks and splash areas above sinks.
10. Walls behind kitchen stoves.
11. Walls of bathrooms that are not solely water closet compartments, other than walls specifically required being cement board.
12. Walls and ceilings in maintenance rooms and service sink rooms.

Add new standard(s) as follows:

ASTM

C1178/C 1178M-11 Specification for Coated Mat Water-Resistant Gypsum Backing Panel

C1325-08b Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Backer Units

C1288-99(2010) Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets

D3273-12 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

Reason: This proposal improves mold resistance in areas that are especially vulnerable to mold growth, such as bathrooms and basements. Mold is linked to many health problems and is notoriously difficult to combat. Similar regulation is pending in New York City.

Bibliography: Urban Green Council, Green Codes Task Force, Health and Toxicity Proposal 7.

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, ASTM D3273-12 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014. ASTM C1178, C1288, or C1325 are currently referenced in the IRC.

GG244-14 : 806.8 (NEW)-SCHEIB1148

GG245-14

807.1, 807.2.1

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

807.1 Sound transmission and sound levels. Where required by Table 302.1, buildings and tenant spaces shall comply with the minimum sound transmission class and maximum sound level requirements of Sections 807.2 through 807.5.2.

Exception: The following buildings and spaces need not comply with this section:

1. Building or structures that have the interior environment open to the exterior environment.
2. Parking structures.
3. Concession stands and toilet facilities in Group A-4 and A-5 occupancies.
4. Group I-2, Condition 2 occupancies that comply with the 2010 FGI-ASHE Guidelines for Design and Construction of Healthcare Facilities.

Revise as follows:

807.2.1 Interior sound transmission. Wall and floor-ceiling assemblies that separate Group A and F occupancies from one another or from Group B, I, M or R occupancies shall have a sound transmission class (STC) of not less than 60 or an apparent sound transmission class (ASTC) of not less than 55 if the completed construction is field tested. Wall and floor-ceiling assemblies that separate Group B, I, M or R occupancies from one another shall have a sound transmission class (STC) of not less than 50 or an apparent sound transmission class (ASTC) of not less than 45 if the completed construction is field tested. Wall and floor-ceiling assemblies that separate Group R condominium occupancies from one another or from other Group B, I, M or R occupancies shall have a sound transmission class (STC) of not less than 55 or an apparent sound transmission class (ASTC) of not less than 50 if the completed construction is field tested.

Exception: This section shall not apply to wall and floor-ceiling assemblies enclosing:

1. Public entrances to tenants of covered and open mall buildings.
2. Concession stands and lavatories in Group A-4 and A-5 occupancies.
3. Spaces and occupancies that are accessory to the main occupancy.
4. Group I-2, Condition 2 occupancies that comply with the 2010 FGI-ASHE Guidelines for Design and Construction of Healthcare Facilities.

Reason: Group I-2, Condition 2 (hospitals) are heavily regulated by the FGI Guidelines for Design and Construction of Healthcare Facilities that include stringent acoustical requirements. Adding additional layers of Codes to hospitals creates unnecessary potential for confusion between designers and Building Officials and expensive conflict resolution where Codes disagree. The FGI Guidelines are specifically created to meet the unique needs of hospitals and are the best source for healthcare acoustical minimum standards.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

GG245-14 : 807.1-PAARLBERG660

GG246-14

807.2, 807.2.3 (New)

Proponent: Jason Thompson, representing NCMA/MACS (jthompson@ncma.org)

Revise as follows:

807.2 Sound transmission. Sound transmission classes established by laboratory measurements shall be determined in accordance with ASTM E 413 based on measurements in accordance with ASTM E 90. Sound transmission classes for concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined in accordance with ASTM E 413 based on measurements in accordance with ASTM E 90. Field measurements of completed construction, if conducted, shall be in accordance with ASTM E 336 where conditions regarding room size and absorption required in ASTM E 336 are met. Outdoor-indoor transmission classes shall be determined in accordance with ASTM E1332 based on measurements in accordance with ASTM E90 or ASTM E966. Outdoor- indoor transmission classes for concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or shall be determined in accordance with ASTM E1332 based on measurements in accordance with ASTM E90 or ASTM E966.

Add new text as follows:

807.2.3 Exterior sound transmission. For all buildings other than Group F, S, and U the outdoor-indoor transmission classifications shall comply with Section 8.3.3.1 of ASHRAE 189.1.

Add new standard(s) as follows:

ASTM

E1332-10a, Standard Classification for Rating Outdoor-Indoor Sound Attenuation
E966-10e1, Standard Guide for Field Measurements of Airborne Sound Insulation of Building Façades and Façade Elements

Reason: Controlling the levels of exterior-generated noise is fundamentally as important as interior-generated noise. This modification introduces the minimum OITC values currently stipulated in ASHRAE 189.1.

Cost Impact: Will increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, ASTM E1332-10a, ASTM E966-10e1 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014. ASHRAE 189.1 and ASTM E90 are already referenced in the IGCC.

GG246-14 : 807.2-THOMPSON881

GG247-14

807.2.2, 807.5, 807.5.1, 807.5.1.1 (New), 807.5.1.2 (New), 807.5.2, 807.5.3, 807.5.4, 807.6, 807.6.1, 807.6.2

Proponent: Maureen Traxler, Seattle Dept of Planning & Development, representing Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

807.2.2 Mechanical and emergency generator equipment and systems. Wall and floor-ceiling assemblies that separate a mechanical equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 50 or an apparent sound transmission class (ASTC) of not less than 45 if the completed construction is field tested, Wall and floor-ceiling assemblies that separate a generator equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 60 or an apparent sound transmission class (ASTC) of not less than 55 if the completed construction is field tested. Sound transmission shall be determined in accordance with ASTM E 90 and ASTM E 413. Concrete masonry and clay masonry assemblies are permitted to be tested in accordance with TMS 0302.

807.5 Special inspections for sound levels and sound transmission. An approved agency, funded by the building owner, shall furnish report(s) of test findings indicating that the sound level and sound transmission results are in compliance with this section, applicable laws and ordinances, and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Test reports are not required for sound transmission of *approved* assemblies with an established sound transmission class (STC) rating.

807.5.1 Testing for mechanical and electrical generator equipment outside of buildings. Special inspections shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section 807.3.1. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. ~~Such testing shall demonstrate that the equipment is capable of compliance with the night-time limits under normal night-time operating conditions, and if higher sound levels are possible during the daytime, compliance with the daytime limits shall also be demonstrated.~~

Add new text as follows:

807.5.1.1 Sound level testing. Sound level testing shall demonstrate that the equipment is capable of compliance with the night-time limits under normal night-time operating conditions, and if higher sound levels are possible during the daytime, compliance with the daytime limits shall also be demonstrated.

807.5.1.2 Sound transmission testing. Sound transmission testing shall occur on a Tuesday, Wednesday or Thursday at both the day and night times within the periods shown in Table 807.3.1.

Revise as follows:

807.5.2 Testing for building system background noise. Special inspections shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Sections 807.3.1 and 807.3.2. Testing shall be executed within not less than 50 percent of the total number of rooms contained in a building or structure of the types listed in Table 807.3.2 for the given occupancy exclusive of closets and storage rooms less than 50 square feet (4.65 m²) in area, and exclusive of toilet facilities in accordance with Table 903.4. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.

~~807.5.4~~ **807.5.3 HVAC background sound.** HVAC system caused background sound levels for all modes of operation within rooms shall be in accordance with the lower and upper noise criteria (NC) limits as shown in Table 807.3.2. Special inspections shall be required and conducted in accordance with Section 903.1 in order to demonstrate compliance.

Delete without substitution:

~~807.5.3 Separating assemblies.~~ Wall and floor-ceiling assemblies that separate a mechanical or emergency generator equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 60 determined in accordance with ASTM E 90 and ASTM E 413, or for concrete masonry and clay masonry assemblies as calculated in accordance with TMS 0302 or as determined in accordance with ASTM E 90 and ASTM E 413.

~~807.6 Special inspections for sound transmission.~~ An approved agency, employed by the building owner, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.

~~807.6.1 Testing for mechanical and emergency generator equipment outside of buildings.~~ In accordance with Section 807.3.1, all mechanical and emergency generator equipment shall be field tested in accordance with Table 903.1. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. Such testing shall occur on a Tuesday, Wednesday or Thursday at both the day and night times within the periods shown in Table 807.3.1.

~~807.6.2 Testing for building system background noise.~~ Testing shall be executed in accordance with Section 807.3.1 within not less than 50 percent of the total number of rooms contained in a building or structure, exclusive of closets and storage rooms less than 50 square feet (4.65 m²) in area, and exclusive of toilet facilities in accordance with Table 903.1. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.

Reason: This is an editorial proposal to eliminate redundancy by combining Sections 807.5 and 807.6. The same special inspections are required by both sections. The unique requirements of 807.6 are incorporated into the new exception to 807.5 and Section 807.5.1.2.

Section 807.5.3 contains requirements for sound transmission class. Since the subject of 807.5 is testing, the requirements are moved into Section 807.2.2 where provisions for sound transmission class are currently located.

Cost Impact: Will not increase the cost of construction

GG247-14 : 807.2.2-TRAXLER1134

GG248-14

807.2.2 (New)

Proponent: Martha VanGeem, representing self (martha.vangeem@gmail.com)

Add new text as follows:

807.2.2 (New) Exterior sound transmission. The building envelope for those portions of buildings that contain Group B, I or R occupancies and are located within 1000 feet of limited access expressways shall comply with both of the following:

1. Exterior wall and roof-ceiling assemblies shall be constructed with a sound transmission class (STC) rating of not less than 50 or an apparent sound transmission class (ASTC) of not less than 45
2. Fenestration shall not be single pane.

Reason: Controlling noise that enters a building space improves indoor comfort and can increase occupant productivity. This added section requires the same level of resistance to sound in terms of sound transmission coefficient (STC) for building assemblies as required in the IBC for separation of dwelling units (Section 1207).

Rather than specify an STC of at least 30 for fenestration, not allowing single pane glazing has been specified. They are essentially equivalent requirements, however, "fenestration that is not single pane" is easier to enforce.

One of the biggest short-comings in green buildings is noise. As stated in an article in [Buildings](#), entitled "Green Noise" (K. Roy, October 25, 2012), "...according to ongoing research at the Center for the Built Environment (CBE), it [acoustical comfort] is the lowest performing IEQ factor in green buildings. Moreover, in all buildings surveyed, the level of acoustic satisfaction was rated as the lowest performance IEQ factor, and the only negative (dissatisfaction) factor overall."

People generally value an environment with less noise and will often pay a premium for it.

Bibliography:

Buildings, "Green Noise", K. Roy, October 25, 2012,
http://www.buildings.com/DesktopModules/BB_ArticleMax/ArticleDetail/BBArticleDetailPrint.aspx?ArticleID=14836&Template=Standard_Print.ascx&siteID=1

Cost Impact: Will increase the cost of construction

GG248-14 : 807.2.2 (NEW)-VANGEEM1055

GG249-14
807.3.2

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

TABLE 807.3.2
MAXIMUM PERMISSIBLE INDOOR BACKGROUND SOUND IN ROOMS

OCCUPANCY TYPE	ROOM	NOISE CRITERIA (NC) LIMITS
Assembly A-1	Symphony, concert, recital halls	30
	Motion picture theaters	40
Assembly A-3	Places of religious worship, lecture halls not part of educational facilities	35
	Art gallery, exhibit hall, funeral parlor, libraries, and museums	40
	Courtroom Educational occupancies above 12th grade	35 (See Educational)
Assembly A-4	Gymnasiums, natatoriums and arenas with seating areas	45
Business B	Office—enclosed greater than 300 square feet	35
	Office—enclosed less than or equal 300 square feet	40
	Office—open plan Corridors and lobbies Conference rooms Educational occupancies above 12th grade	45 45 35 (See Educational)
Educational E	Core learning lecture and classrooms that are less than or equal to 20,000 cubic feet in volume	ANSI/ASA S12.60-2010/Part 1 or ANSI/ASA S12.60-2009/Part 2
	Core learning lecture and classrooms that are greater than 20,000 cubic feet in volume Open plan classrooms Administrative offices and rooms Music teaching studios Music practice rooms	
Institutional I-2	<u>All areas</u> Wards, Private and semi-private patient rooms Operating rooms Corridors and public areas	2010 FGI-ASHE Guidelines for Design and Construction of Healthcare Facilities
	<u>Rooms or suites</u>	25 to 35
	Bathroom, kitchen, utility room	40
Residential R-1 and R-2	Meeting rooms Corridors and lobbies Service areas	35
		45
		45

For SI: 1 square foot = 0.093 m², 1 cubic foot = 28.31 L.

Reason: Group I-2, Condition 2 (hospitals) is heavily regulated by the FGI Guidelines for Design and Construction of Healthcare Facilities that include stringent acoustical requirements. Adding additional layers of Codes to hospitals creates unnecessary potential for confusion between designers and Building Officials and expensive conflict resolution where Codes disagree. The FGI Guidelines are specifically created to meet the unique needs of hospitals and are the best source for healthcare acoustical minimum standards.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering

(ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

GG249-14 : TABLE807.3.2-PAARLBERG661

GG250-14

807.4

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Chair of the Sustainability, Energy and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

807.4 Structure-borne sounds. Floor and ceiling assemblies ~~between dwelling rooms or dwelling units and between dwelling rooms or dwelling units and separating sleeping units or dwelling units from~~ public or service areas within the structure in occupancies classified as Group A1, A2, A3, B, E, I, M or R, ~~or sleeping units or dwelling units from adjacent sleeping units or dwelling units in Group R occupancies,~~ shall have an impact insulation classification (IIC) rating of not less than 50 where laboratory-tested and 45 where field-tested when tested in accordance with ASTM E 492. New laboratory tests for impact insulation class (IIC) of an assembly are not required where the IIC has been established by prior tests.

Reason: The existing text in Section 807.4 refers to “dwelling rooms and dwelling units.” “Dwelling rooms” is not a term used in other ICC codes. Furthermore, it is not necessary or of great advantage to require that floor-ceilings between rooms within a dwelling unit be designed to reduce structure born sounds. “Sleeping units,” however, is a term that is used in the ICC codes, and addressing structure borne sounds between sleeping units would be advantageous.

The language in this section was also revised to reduce the number of “ands” and “ors” to improve clarity.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG250-14 : 807.4-THOMPSON355

GG251-14 807.5

Proponent: Barry Greive, representing Target Corporation (barry.greive@target.com)

Revise as follows:

807.5 Special inspections for sound levels. An approved agency, funded by the building owner, shall furnish report(s) of test findings indicating that the sound level results are in compliance with this section, applicable laws and ordinances, and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Special Inspections and reports are not required for approved assemblies with an established sound transmission class (STC) rating.

Reason: Special inspections are not needed on assemblies that have already been tested and have an established sound rating. 807.6 has an exception and this should have also been carried over to this section since they are similar in nature, this will bring consistency to section 807. A similar proposal is being carried to 807.5 for consistency.

Cost Impact: Will not increase the cost of construction.

GG251-14 : 807.5 #2-GREIVE1111

GG252-14

807.5

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

807.5 Special inspections for sound levels. An approved agency, funded by the building owner, shall furnish report(s) of test findings indicating that the sound level results are in compliance with this section, applicable laws and ordinances, and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Group I-2, Condition 2 occupancies that comply with 2010 FGI-ASHE are not required to furnish a report of test findings of the sound level results.

Reason: Hospitals that follow the 2010 FGI Guidelines are required to be designed and constructed to specific sound transmission and sound level requirements for each particular section of the building. These requirements are specific to the clinical needs of the patients based on the level of care they are receiving. Since the Table 807.3.2 specifically requires the use of the 2010 FGI Guidelines, inspections should follow the requirements in that document.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction.

GG252-14 : 807.5-PAARLBERG664

GG253-14

807.5, 807.5.1, 807.5.2, 807.5.4, 807.6

Proponent: Maureen Traxler, Seattle Dept of Planning & Development, representing Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

807.5 ~~Special inspections~~ Commissioning for sound levels. An approved agency, funded by the building owner, shall furnish report(s) of test findings indicating that the sound level results are in compliance with this section, applicable laws and ordinances, and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

807.5.1 Testing for mechanical and electrical generator equipment outside of buildings. ~~Special inspections~~ Commissioning shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section 807.3.1. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. Such testing shall demonstrate that the equipment is capable of compliance with the night-time limits under normal night-time operating conditions, and if higher sound levels are possible during the daytime, compliance with the daytime limits shall also be demonstrated.

807.5.2 Testing for building system background noise. ~~Commissioning~~ ~~Special inspections~~ shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section 807.3.2. Testing shall be executed within not less than 50 percent of the total number of rooms contained in a building or structure of the types listed in Table 807.3.2 for the given occupancy in accordance with Table 903.1. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.

807.5.4 HVAC background sound. HVAC system caused background sound levels for all modes of operation within rooms shall be in accordance with the lower and upper noise criteria (NC) limits as shown in Table 807.3.2. Commissioning ~~Special inspections~~ shall be required and conducted in accordance with Section 903.1 in order to demonstrate compliance.

807.6 ~~Special inspections~~ Commissioning for sound transmission. An approved agency, employed by the building owner, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.

Reason: The testing required by Sections 807.5 and 807.6 is more like commissioning than special inspection. These sections require testing to show that the required sound level and sound transmission ratings are achieved. They require testing, not inspection. Both sections require the testing to be done according to Section 903, Commissioning.

Chapter 2 defines commissioning as "A process that verifies and documents that the selected building and site systems have been designed, installed, and function in accordance with the owner's project requirements and construction documents,

and minimum code requirements” The purpose of the testing required by Sections 807.5 and 807.6 is to verify that the equipment functions in compliance with the requirements of Table 807.3.1 and 807.3.2.

Cost Impact: Will not increase the cost of construction.

GG253-14 : 807.5 #1-TRAXLER1136

GG254-14

807.5, 807.6

Proponent: Maureen Traxler, Seattle Dept of Planning & Development, representing Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

807.5 Special inspections for sound levels. An approved agency, ~~employed~~ funded by the building owner, shall furnish report(s) of test findings indicating that the sound level results are in compliance with this section, ~~applicable laws and ordinances~~, and the construction documents. Discrepancies shall be brought to the attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the design professional and code official prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

807.6 Special inspections for sound transmission. An approved agency, employed by the building owner, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the design professional and code official prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.

Reason: The special inspection sections for acoustics are revised to be more consistent with the IBC. Section 807.5 is modified to be consistent with Section 807.6 and IBC Section 1704.2 which state that the owner or the designer employs rather than funds the special inspection agency.

"Applicable laws and ordinances" is deleted for consistency with Section 807.6. In addition, the code official may not have authority to enforce these other laws, and the other laws should have their own enforcement mechanisms independent of the IGCC. The phrase is extremely vague and open-ended. How could the special inspector or code official say whether the project complies with unnamed laws?

An additional step is added to the inspection process in Sections 807.5 and 807.6 that gives the contractor a chance to correct deficiencies before the designer and code official are notified. IBC Section 1704.2.4 also contains this provision.

Cost Impact: Will not increase the cost of construction

GG254-14 : 807.5 #2-TRAXLER1149

GG255-14

807.5.3, 807.5.4, 807.6, 807.6.1, 807.6.2

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Chair of the ICC Sustainability, Energy and High Performance Code Action Committee (SEHPCAC) SEHPCAC

Delete without substitution:

~~**807.5.3 Separating assemblies.** Wall and floor-ceiling assemblies that separate a mechanical or emergency generator equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 60 determined in accordance with ASTM E 90 and ASTM E 413, or for concrete masonry and clay masonry assemblies as calculated in accordance with TMS 0302 or as determined in accordance with ASTM E 90 and ASTM E 413.~~

~~**807.5.4 HVAC background sound.** HVAC system caused background sound levels for all modes of operation within rooms shall be in accordance with the lower and upper noise criteria (NC) limits as shown in Table 807.3.2. Special inspections shall be required and conducted in accordance with Section 903.1 in order to demonstrate compliance.~~

~~**807.6 Special inspections for sound transmission.** An approved agency, employed by the building owner, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.~~

~~**Exception:** Test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.~~

~~**807.6.1 Testing for mechanical and emergency generator equipment outside of buildings.** In accordance with Section 807.3.1, all mechanical and emergency generator equipment shall be field tested in accordance with Table 903.1. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. Such testing shall occur on a Tuesday, Wednesday or Thursday at both the day and night times within the periods shown in Table 807.3.1.~~

~~**807.6.2 Testing for building system background noise.** Testing shall be executed in accordance with Section 807.3.1 within not less than 50 percent of the total number of rooms contained in a building or structure, exclusive of closets and storage rooms less than 50 square feet (4.65 m²) in area, and exclusive of toilet facilities in accordance with Table 903.1. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.~~

Reason: This proposal deletes sections that are essentially duplicated in Section 807. The following sections are the duplicated sections that are to remain unchanged:

807.2.2 Mechanical and emergency generator equipment and systems. Wall and floor-ceiling assemblies that separate a mechanical equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 50 or an apparent sound transmission class (ASTC) of not less than 45 if the completed construction is field tested, Wall and floor-ceiling assemblies that separate a generator equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 60 or an apparent sound transmission class (ASTC) of not less than 55 if the completed construction is field tested.

807.3.2 Sound of HVAC and mechanical systems within buildings. Sound levels within rooms generated by HVAC and mechanical systems within the building, including electrical generators used regularly but excluding emergency generators, for all modes of operation shall not exceed the limits shown in Table 807.3.2.

807.4 Structure-borne sounds. Floor and ceiling assemblies between dwelling rooms or dwelling units and between dwelling rooms or dwelling units and public or service areas within the structure in occupancies classified as Group A1, A2, A3, B, E, I, M or R shall have an impact insulation classification (IIC) rating of not less than 50 where laboratory-tested and 45 where field-tested when tested in accordance with ASTM E 492. New laboratory tests for impact insulation class (IIC) of an assembly are not required where the IIC has been established by prior tests.

807.5 Special inspections for sound levels. An approved agency, funded by the building owner, shall furnish report(s) of test findings indicating that the sound level results are in compliance with this section, applicable laws and ordinances, and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

807.5.1 Testing for mechanical and electrical generator equipment outside of buildings. Special inspections shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section 807.3.1. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. Such testing shall demonstrate that the equipment is capable of compliance with the night-time limits under normal night-time operating conditions, and if higher sound levels are possible during the daytime, compliance with the daytime limits shall also be demonstrated.

807.5.2 Testing for building system background noise. Special inspections shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section 807.3.2. Testing shall be executed within not less than 50 percent of the total number of rooms contained in a building or structure of the types listed in Table 807.3.2 for the given occupancy in accordance with Table 903.1. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.

These sections that are proposed to be deleted are virtually identical to the corresponding provisions in Public Version 2.0 of the IgCC (the version that preceded the 2012 IgCC). The sections that remain are the versions that were improved in the code development process that led to the creation of the 2012 IgCC. The IgCC committee in the 2011 Code Development Cycle apparently inadvertently approved code changes that led to this duplication.

Although the sections proposed to be deleted are not identical to those that are to be retained, they are substantially similar. The SEHPCAC realizes that there may be some information in the deleted proposals that may be valid. However, this level of redundancy creates much confusion and any information in the sections that are proposed to be deleted can be addressed in the public comment period by any interested parties.

The following table shows the existing sections to be retained and the corresponding redundant sections that are proposed to be deleted:

Existing Sections/Titles to be Retained	Corresponding Redundant Sections/Titles to be Deleted
807.2.2 Mechanical and emergency generator equipment and systems.	807.5.3 Separating assemblies.
807.3.2 Sound of HVAC and mechanical systems within buildings.	807.5.4 HVAC background sound.
807.5 Special inspections for sound levels.	807.6 Special inspections for sound transmission.
807.5.1 Testing for mechanical and electrical generator equipment outside of buildings.	807.6.1 Testing for mechanical and emergency generator equipment outside of buildings.
807.5.2 Testing for building system background	807.6.2 Testing for building system background

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG255-14 : 807.5.3-THOMPSON356

GG256-14

807.6

Proponent: Barry Greive, Target Corporation, representing Target Corporation
(barry.greive@target.com)

Revise as follows:

807.6 Special inspections for sound transmission. An approved agency, employed by the building owner, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Special Inspections and test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.

Reason: Special inspections are not needed on assemblies that have already been tested and have an established sound rating. This is a minor change to this exception to clarify that not only the report is not needed the special inspection is not needed for these already tested assemblies. A similar proposal is submitted for 807.5. This will bring consistency to section 807.

Cost Impact: Will not increase the cost of construction.

GG256-14 : 807.6-GREIVE1115

GG257-14

807.6

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

807.6 Special inspections for sound transmission. An approved agency, employed by the building owner, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exceptions:

1. Test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.
2. Group I-2, Condition 2 occupancies that comply with 2010 FGI-ASHE are not required furnishing a report of test findings of the sound transmission results.

Reason: Hospitals that follow the 2010 FGI Guidelines are required to be designed and constructed to specific sound transmission and sound level requirements for each particular section of the building. These requirements are specific to the clinical needs of the patients based on the level of care they are receiving. Since the Table 807.3.2 specifically requires the use of the 2010 FGI Guidelines, inspections should follow the requirements in that document.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

GG257-14 : 807.6-PAARLBERG666

GG258-14

302.1, 807, 903.1, Appendix E (New)

Proponent: Mark Nowak, representing Steel Framing Alliance

Revise as follows:

807-APPENDIX E **ACOUSTICS**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

~~807.1~~E101.1 Sound transmission and sound levels. ~~Where required by Table 302.1, Buildings and tenant spaces shall comply with the minimum sound transmission class and maximum sound level requirements of Sections E101.2 ~~807.2~~ through E101.5.2 ~~807.5.2~~.~~

Exception: The following buildings and spaces need not comply with this section:

1. Building or structures that have the interior environment open to the exterior environment.
2. Parking structures.
3. Concession stands and toilet facilities in Group A-4 and A-5 occupancies.

~~807.2~~E101.2 Sound transmission. Sound transmission classes established by laboratory measurements shall be determined in accordance with ASTM E 413 based on measurements in accordance with ASTM E 90. Sound transmission classes for concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined in accordance with ASTM E 413 based on measurements in accordance with ASTM E 90. Field measurements of completed construction, if conducted, shall be in accordance with ASTM E 336 where conditions regarding room size and absorption required in ASTM E 336 are met.

~~807.2.1~~E101.2.1 Interior sound transmission. Wall and floor-ceiling assemblies that separate Group A and F occupancies from one another or from Group B, I, M or R occupancies shall have a sound transmission class (STC) of not less than 60 or an apparent sound transmission class (ASTC) of not less than 55 if the completed construction is field tested. Wall and floor-ceiling assemblies that separate Group B, I, M or R occupancies from one another shall have a sound transmission class (STC) of not less than 50 or an apparent sound transmission class (ASTC) of not less than 45 if the completed construction is field tested. Wall and floor-ceiling assemblies that separate Group R condominium occupancies from one another or from other Group B, I, M or R occupancies shall have a sound transmission class (STC) of not less than 55 or an apparent sound transmission class (ASTC) of not less than 50 if the completed construction is field tested.

Exception: This section shall not apply to wall and floor-ceiling assemblies enclosing:

1. Public entrances to tenants of covered and open mall buildings.
2. Concession stands and lavatories in Group A-4 and A-5 occupancies.
3. Spaces and occupancies that are accessory to the main occupancy.

~~807.2.2~~E101.2.2 Mechanical and emergency generator equipment and systems. Wall and floor-ceiling assemblies that separate a mechanical equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 50 or an apparent sound transmission class (ASTC) of not less than 45 if the completed construction is field tested, Wall and floor-ceiling assemblies that separate a generator equipment room or space from the remainder of the

building shall have a sound transmission class (STC) of not less than 60 or an apparent sound transmission class (ASTC) of not less than 55 if the completed construction is field tested.

~~807.3~~ E101.3 Sound levels. The design and construction of mechanical and electrical generator systems and of walls and floor-ceilings separating such equipment from the outdoors or other building space shall achieve sound levels not greater than specified in Sections E101.3.1 ~~807.3.4~~ and E101.3.2 ~~807.3.2~~ during the normal operation of mechanical equipment and generators. Electrical generators used only for emergencies are exempt from the limits on sound levels within the building and need only meet daytime limits for sound-reaching boundaries. Where necessary, walls and floor-ceiling assemblies with sound transmission class (STC) ratings greater than specified in Section E101.2.2 ~~807.2.2~~ shall be used to meet this requirement.

~~807.3.4~~ E101.3.1 Sound of mechanical and electrical generator equipment outside of buildings. Where mechanical equipment or electrical generators are located outside of the building envelope or their sound is exposed to the exterior environment, the sound reaching adjacent properties shall comply with all applicable ordinances and zoning performance standards. In the absence of an ordinance or zoning performance standard specifying sound limits at the boundary, or a law specifying different limits if limits are imposed, an adjacent property at the boundary shall not be subjected to a sound level greater than indicated in Table E101.3.1 ~~807.3.4~~ because of the sound of the equipment. Where a generator is used only for providing emergency power and all periodic operational testing is done during the daytime period of Table E101.3.1 ~~807.3.4~~, the sound of a generator during the night-time hours shall meet the daytime limits.

**TABLE ~~807.3.4~~ E101.3.1
MAXIMUM PERMISSIBLE OUTDOOR A-WEIGHTED SOUND LEVELS**

(Portions of table not shown remain unchanged.)

~~807.3.2~~ E101.3.2 Sound of HVAC and mechanical systems within buildings. Sound levels within rooms generated by HVAC and mechanical systems within the building, including electrical generators used regularly but excluding emergency generators, for all modes of operation shall not exceed the limits shown in Table E101.3.2 ~~807.3.2~~.

**TABLE ~~807.3.2~~ E101.3.2
MAXIMUM PERMISSIBLE INDOOR BACKGROUND SOUND IN ROOMS**

(Portions of table not shown remain unchanged.)

~~807.4~~ E101.4 Structure-borne sounds. Floor and ceiling assemblies between dwelling rooms or dwelling units and between dwelling rooms or dwelling units and public or service areas within the structure in occupancies classified as Group A1, A2, A3, B, E, I, M or R shall have an impact insulation classification (IIC) rating of not less than 50 where laboratory-tested and 45 where field-tested when tested in accordance with ASTM E 492. New laboratory tests for impact insulation class (IIC) of an assembly are not required where the IIC has been established by prior tests.

~~807.5~~ E101.5 Special inspections for sound levels. An approved agency, funded by the building owner, shall furnish report(s) of test findings indicating that the sound level results are in compliance with this section, applicable laws and ordinances, and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Add new table as follows:

TABLE E101.5(1)
COMMISSIONING PLAN FOR SOUND TRANSMISSION

<u>SYSTEM REQUIRING VERIFICATION</u>	<u>COMMISSIONING PLAN FOR SOUND TRANSMISSION</u>	<u>PREOCCUPANCY</u>	<u>POST-OCCUPANCY METHOD</u>
<u>Mechanical and emergency generator equipment located outside buildings or located where exposed to exterior environment</u>	<u>X</u>	<u>None</u>	<u>Field testing and verification</u>
<u>HVAC background noise</u>	<u>X</u>	<u>None</u>	<u>Field testing and verification</u>

Revise as follows:

~~807.5.4~~ E101.5.1 Testing for mechanical and electrical generator equipment outside of buildings. Special inspections shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section E101.3.1 ~~807.3.1~~. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. Such testing shall demonstrate that the equipment is capable of compliance with the night-time limits under normal night-time operating conditions, and if higher sound levels are possible during the daytime, compliance with the daytime limits shall also be demonstrated.

~~807.5.2~~ E101.5.2 Testing for building system background noise. Special inspections shall be conducted in accordance with Section 903.1 to demonstrate compliance with the requirements of Section E101.3.2 ~~807.3.2~~. Testing shall be executed within not less than 50 percent of the total number of rooms contained in a building or structure of the types listed in Table E101.3.2 ~~807.3.2~~ for the given occupancy in accordance with Table E101.5 (1) ~~903.4~~. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.

~~807.5.3~~ E101.5.3 Separating assemblies. Wall and floor-ceiling assemblies that separate a mechanical or emergency generator equipment room or space from the remainder of the building shall have a sound transmission class (STC) of not less than 60 determined in accordance with ASTM E 90 and ASTM E 413, or for concrete masonry and clay masonry assemblies as calculated in accordance with TMS 0302 or as determined in accordance with ASTM E 90 and ASTM E 413.

~~807.5.4~~ E101.5.4 HVAC background sound. HVAC system caused background sound levels for all modes of operation within rooms shall be in accordance with the lower and upper noise criteria (NC) limits as shown in Table E101.3.2 ~~807.3.2~~. Special inspections shall be required and conducted in accordance with Section 903.1 in order to demonstrate compliance.

807.6 E101.6 Special inspections for sound transmission. An approved agency, employed by the building owner, shall furnish report(s) of test findings indicating that the results are in compliance with this section and the construction documents. Discrepancies shall be brought to the attention of the design professional and *code official* prior to the completion of that work. A final testing report documenting required testing and corrections of any discrepancies noted in prior tests shall be submitted at a point in time agreed upon by the building owner, or building owner's agent, design professional, and the *code official* for purposes of demonstrating compliance.

Exception: Test reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.

807.6.1 E101.6.1 Testing for mechanical and emergency generator equipment outside of buildings. In accordance with Section E101.3.1 ~~807.3.1~~, all mechanical and emergency generator equipment shall be field tested in accordance with Table E101.5 (1) ~~903.4~~. Testing shall be conducted following the complete installation of the equipment or generators, the installation of sound reduction barriers, and balancing and operation of the equipment or generators. Testing shall be at locations representing the four cardinal directions from the face of the project building. Such testing shall occur on a Tuesday, Wednesday or Thursday at both the day and night times within the periods shown in Table E101.3.1 ~~807.3.1~~.

807.6.2 E101.6.2 Testing for building system background noise. Testing shall be executed in accordance with Section E101.3.1 ~~807.3.1~~ within not less than 50 percent of the total number of rooms contained in a building or structure, exclusive of closets and storage rooms less than 50 square feet (4.65 m²) in area, and exclusive of toilet facilities in accordance with Table E101.5(1) ~~903.4~~. Testing shall occur following the complete installation of the equipment and systems, the installation of any sound reduction barriers, and balancing and operation of the equipment and systems.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT			
804.2	Post-Construction Pre-Occupancy Baseline IAQ Testing	<input type="checkbox"/> Yes	<input type="checkbox"/> No
807.4	Sound transmission and sound levels	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 8: Indoor Environmental Quality and Comfort						
Building construction, features, operations and maintenance facilitation						
Air-handling system access	X	X	Field inspection and verification	During construction and prior to occupancy	18 - 24 months	802.2
Air-handling system filters	X	X	Field inspection and verification	During construction and prior to occupancy	18 - 24 months	802.3

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
HVAC systems						
Temperature and humidity in occupied spaces	—	X	Field inspection and verification	—	18 - 24 months	803.2
Specific indoor air quality & pollutant control measures						
Listing, installation and venting of fireplaces and combustion appliances	X	—	Field inspection and verification	During construction and prior to occupancy	—	804.1
Sound transmission						
Mechanical and emergency generator equipment located outside buildings or located where exposed to exterior environment.	X	None	Field testing and verification	See Section 807.5.1	None	807.5.1
HVAC background sound	X	None	Field testing and verification	See Section 807.5.2	None	807.5.2

For SI: 1 square foot = 0.0929 m².

(Portions of table not shown remain unchanged.)

Reason: The base IRC and IBC codes already address acoustics issues from a basic health and safety perspective. Higher levels of acoustic protection in the IgCC at present are not related to specific improvements in health or safety compared to the base codes. The requirements simply evolved from an argument that more is better.

In addition, there are significant technical issues with this section that would be problematic if not coordinated with local ordinances. For example, the existing language introduces ownership issues into the code. Implementation of a significant part of the requirements for higher STC ratings relies on the term “condominium occupancies” to trigger application. A condominium is not an occupancy use group in the IBC because it is a form of ownership, not a use group or building type. Different types of buildings can be under condominium ownership and this ownership can change throughout the life of the building. Buildings that are not under condominium ownership can be changed to this type of ownership in the future. Often this is regulated in zoning and planning ordinances and that is where these decisions belong.

While there are certainly unique situations where adjacent buildings are impacted by outdoor noise or mechanical equipment, the existing approach in the IgCC does not adequately address this and consists of vague and inconsistent requirements. For example, existing Section 807.3.1 only requires the code requirements to be met in the absence of local laws or ordinances. It does not specify criteria for the local laws or ordinances. An ordinance could be wholly inadequate yet still be used to comply with the IgCC. This section makes the case that acoustics should be a local decision.

Moving the acoustics section to an appendix will assign decision-making on acoustics to the local jurisdiction where specific local conditions and ordinances can be examined for potential conflicts and acceptable protection.

Cost Impact: Will not increase the cost of construction

GG258-14 : 807-NOWAK310

GG259-14

808.2

Proponent: David Collins, Preview Group, representing AIA (dcollins@preview-group.com)

Revise as follows:

808.2 Applicability. Daylighting of building spaces in accordance with Section 808.3 shall be required for the following occupancies:

1. A Group A-3 occupancy where the specific use of the room or space is for reading areas in libraries, waiting areas in transportation terminals, exhibition halls, gymnasiums, and indoor athletic areas.
2. A Group B occupancy where the specific use of the room or space is for educational facilities for students above the 12th grade, laboratories for testing and research, post offices, print shops, offices, and training and skill development not within a school or academic program.
3. Group E, F and S occupancies.
4. Those portions of Group M occupancies located directly underneath a roof, where the net floor area of the entire occupancy is 10,000 square feet (929 m²) or greater.

Exception: Daylighting in Group A-3, B, E, F, M and S occupancies is not required ~~in for any of the following rooms and spaces:~~

1. Building spaces where darkness is required for the primary use of the space, including, but not limited to, light-sensitive material handling and darkrooms.
2. Building spaces that are required to be cooled below 50°F (10°C).
3. Unconditioned buildings that are equipped with exterior doors that, when opened, provide equivalent daylighting.
4. Existing buildings undergoing an alteration, repair, movement, or change of occupancy ~~of existing buildings.~~

Reason: It isn't clear in the code what conditions were exceptions to the requirement for daylighting. With this change it is clear that any of these conditions are allowed to exist and be exempt from the occupancy based requirements in Section 808.2. Removal of the terms "rooms and spaces" clarified that these were conditions not necessarily a specific room or space. Also, as presently worded item 4 was inconsistent with items 1 through 3 in format.

Cost Impact: Will not increase the cost of construction

GG259-14 : 808.2-COLLINS534

GG260-14

808.2

Proponent: Thomas Culp, representing Birch Point Consulting L LC (culp@birchpointconsulting.com)

Revise as follows:

808.2 Applicability. Daylighting of building spaces in accordance with Section 808.3 shall be required for the following occupancies:

1. A Group A-3 occupancy where the specific use of the room or space is for reading areas in libraries, waiting areas in transportation terminals, exhibition halls, convention centers, gymnasiums, and indoor athletic areas.
2. A Group B occupancy where the specific use of the room or space is for laboratories for testing and research, post offices, print shops, offices, educational facilities for students above the 12th grade., laboratories for testing and research, post offices, print shops, offices, and training and skill development not within a school or academic program.
3. Group E, F and S occupancies.
4. Those portions of Group M occupancies located directly underneath a roof, where the net floor area of the entire occupancy is 10,000 square feet (929 m²) or greater.

Exception: Daylighting is not required in the following rooms and spaces:

1. Building spaces where darkness is required for the primary use of the space, including, but not limited to, light-sensitive material handling and darkrooms.
2. Building spaces that are required to be cooled below 50°F (10°C).
3. Unconditioned buildings that are equipped with exterior doors that, when opened, provide equivalent daylighting.
4. Alteration, repair, movement, or change of occupancy of existing buildings.

Reason: This proposal simply updates and clarifies the A-3 and B spaces required to have daylighting. The 2015 IECC requires toplighting in convention centers, and the 2012 IgCC already requires daylighting in exhibition halls. This proposal simply makes the codes consistent by adding convention centers to the list of A-3 spaces where daylighting is required.

Additionally, the space names in group B is reordered to add clarity. For instance, the reordering makes it clear that all lab facilities are included, not just those in educational facilities. This is purely editorial.

Cost Impact: Will not increase the cost of construction

GG260-14 : 808.2 #2-CULP957

GG261-14

808.2

Proponent: Julie Ruth, JRuth Code Consulting, representing American Architectural Manufacturers Association (julruth@aol.com)

Revise as follows:

808.2 Applicability. Daylighting of building spaces in accordance with Section 808.3 shall be required for the following occupancies:

1. A Group A-3 occupancy where the specific use of the room or space is for reading areas in libraries, waiting areas in transportation terminals, exhibition halls, gymnasiums, and indoor athletic areas.
2. A Group B occupancy where the specific use of the room or space is for laboratories for testing and research, post offices, print shops, offices, educational facilities for students above the 12th grade., laboratories for testing and research, post offices, print shops, offices, and training and skill development not within a school or academic program.
3. Group E, F and S occupancies.
4. Those portions of Group M occupancies located directly underneath a roof, where the net floor area of the entire occupancy is 10,000 square feet (929 m²) or greater.

Exception: Daylighting is not required in the following rooms and spaces:

1. Building spaces where darkness is required for the primary use of the space, including, but not limited to, light-sensitive material handling and darkrooms.
2. Building spaces that are required to be cooled below 50°F (10°C).
3. Unconditioned buildings that are equipped with exterior doors that, when opened, provide equivalent daylighting.
4. Alteration, repair, movement, or change of occupancy of existing buildings.

Reason: The intent of this proposal is to clarify the mandatory daylighting provisions of the 2015 IgCC and improve the consistency between them and the 2015 IECC with regards to Group B occupancies.

The provisions for daylighting in Use Group B occupancies, as currently stated in the 2012 IgCC, is confusing and could be subject to misinterpretation. As written, they could be interpreted as only applying to offices, post offices, print shops, testing laboratories and research facilities that are within educational facilities. Such an interpretation would be inconsistent with the requirements of the 2015 IECC and there is no reason for such a limitation of these provisions. This proposal simply reorganizes the list of spaces given so it is clear it applies to all testing and research laboratories, all offices, all post offices, all print shops, etc.

These revisions clarify the intent of this section and provides for greater consistency with the 2015 IECC.

Cost Impact: Will not increase the cost of construction. This proposal does not add any spaces to the list of those required to have mandatory daylighting. Therefore it would not increase the cost of construction.

GG261-14 : 808.2 #1-RUTH227

GG262-14

808.2

Proponent: Julie Ruth, JRuth Code Consulting, representing American Architectural Manufacturers Association (julruth@aol.com); Thomas Culp, Birch Point Consulting (culp@birchpointconsulting.com)

Revise as follows:

808.2 Applicability. Daylighting of building spaces in accordance with Section 808.3 shall be required for the following occupancies:

1. A Group A-3 occupancy where the specific use of the room or space is for reading areas in libraries, waiting areas in transportation terminals, exhibition halls, gymnasiums, and indoor athletic areas.
2. A Group B occupancy where the specific use of the room or space is for educational facilities for students above the 12th grade, laboratories for testing and research, post offices, print shops, offices, and training and skill development not within a school or academic program.
3. Group E, F and S occupancies.
4. Those portions of Group M occupancies located directly underneath a roof, where the net floor area of the entire occupancy is 2500 ~~10,000~~ square feet (232~~929~~ m²) or greater.

Exception: Daylighting is not required in the following rooms and spaces:

1. Building spaces where darkness is required for the primary use of the space, including, but not limited to, light-sensitive material handling and darkrooms.
2. Building spaces that are required to be cooled below 50°F (10°C).
3. Unconditioned buildings that are equipped with exterior doors that, when opened, provide equivalent daylighting.
4. Alteration, repair, movement, or change of occupancy of existing buildings.

Reason:

Ruth: This proposal reduces the threshold size at which Occupancy Group M spaces are required to have mandatory daylighting from 10,000 sq. ft to 2500 sq. ft. The current threshold of 10,000 sq. ft was based upon the provisions of the 2012 IECC. This threshold size was reduced to 2500 sq. ft in The 2015 IECC. Energy modeling has shown that significant reduction in lighting load can be achieved for open spaces that are much smaller than the 10,000 sq. ft originally addressed in both the IECC and IgCC. Reducing this threshold to 2500 sq. ft, as it was reduced for the 2015 IECC, is appropriate.

Culp: The purpose of this proposal is to update the IgCC to be consistent with the revised 2015 IECC toplighting requirement. The 2012 IECC requires a minimum amount of toplighting for certain spaces over 10,000 ft², and section 808.2 of the 2012 IgCC used the same 10,000 ft² threshold to determine when daylighting must be provided in Group M occupancies (although the IgCC allows the daylight area to include both toplighting or sidelighting). Following a cost effectiveness study by PNNL for ASHRAE 90.1, both ASHRAE 90.1-2013 and the 2015 IECC were updated to reduce the size threshold to 2,500 ft². (An exception was also added to account for both toplighting and sidelighting areas.) Therefore, this proposal simply updates the threshold in section 808.2 for Group M occupancies to ensure the 2015 IgCC is consistent.

Cost Impact: Will increase the cost of construction.

Ruth: This proposal would require daylighting in all Use Group M occupancies that are greater than 2500 sq. ft. in area, regardless of ceiling height. It has the potential to increase cost for those Use Group M occupancies that are greater than 2500 sq. ft. in area with ceilings below 15 ft in height. Such buildings represent a relatively small portion of all Use Group M occupancies.

Culp: This proposal will increase the cost of construction for Group M spaces between 2,500 ft² and 10,000 ft² with ceiling heights less than 15 ft. (Those spaces with ceiling heights greater than 15 ft are already required to meet this requirement in the 2015 IECC.) The 2,500 ft² threshold was found to meet ASHRAE 90.1 cost effectiveness criteria for ASHRAE 90.1-2013.

GG262-14 : 808.2 #2-RUTH28

GG263-14

202 (New), 202, 808.3.1, 808.3.1.2, 808.3, 808.3.1.1, 808.3.2

Proponent: Jack Bailey, One Lux Studio, representing International Association of Lighting Designers (jbailey@oneluxstudio.com)

Add new definition as follows:

DAYLIGHT ZONE. That portion of a building's interior floor area that is illuminated by natural light.

Delete without substitution:

~~**DAYLIT AREA.** That portion of a building's interior floor area that is regularly illuminated by natural light.~~

Revise as follows:

808.3 Daylit area of building spaces. In buildings not greater than two stories above grade, not less than 50 percent of the net floor area shall be located within a daylit area. In buildings three or more stories above grade, not less than 25 percent of the net floor area shall be located within a daylit area. Buildings required to have more than 25,000 square feet (2323 m²) of daylit area shall comply with Section 808.3.2. All other buildings shall comply with either Section 808.3.1 or Section 808.3.2.

Exception: For buildings not less than three stories above grade with obstructed exterior walls or shaded roofs, the required daylit area shall be modified in accordance with Equation 8-1.

Required daylit area $\geq 25\% \times$
TDP

(Equation 8-1)

The total daylight potential (TDP) is a weighted average of the individual daylight potentials for each floor:

$$\text{TDP} = \Sigma(\text{DP}_1 \times \text{FA}_1/\text{TF}) + (\text{DP}_2 \times \text{FA}_2/\text{TF}) +$$

...

For floors with roof area immediately above:

$$\text{DP}_{1,2} = 1 - [(\text{OW}_1/\text{TW}_1) \times (\text{OR}_1/\text{TR}_1)]$$

For floors without roof area immediately above:

$$\text{DP}_{1,2} = 1 - (\text{OW}_1/\text{TW}_1)$$

The length of obstructed exterior wall for each floor. A wall shall be considered to be obstructed where the distance from the wall to any building or geological formation that would block access to daylight is less than the height from the top of the finished floor to the top of the building or geologic formation, that does not face a public way or a yard or court complying with Section 1206 of the International Building Code or where the distance to any buildings, structures, or geological formations in front of the wall is less than two times the height of the buildings, structures, or geological formations.

$\text{OW}_{1,2}$ = top of the building or geologic formation, that does not face a public way or a yard or court complying with Section 1206 of the International Building Code or where the distance to any buildings, structures, or geological formations in front of the wall is less than two times the height of the buildings, structures, or geological formations.

For the purposes of this determination, the maximum allowed heights of buildings or structures on adjacent property under existing zoning regulations is permitted to be considered.

$\text{TW}_{1,2}$ = The total length of exterior wall for each floor.

$\text{OR}_{1,2}$ = The roof area immediately above each floor that is shaded during the peak sun angle on the summer solstice by permanent features of the building, or by permanent features of adjacent buildings or geologic formations.

$\text{TR}_{1,2}$ = The total roof area immediately above each floor.

FA_{1,2} = The *total floor area* of each
TF = The *total building floor area*.

Delete without substitution:

808.3.1 Daylight prescriptive requirements. Daylit areas shall comply with Section 808.3.1.1 or 808.3.1.2. For determining the total daylit area, any overlapping daylit areas shall be counted only once.

The total daylight area shall be the sum of the area of all sidelighting daylight zones and the area of all toplighting zones, except that sidelighting daylight zones shall not be included in the calculation of the area of toplighting daylight areas.

Revise as follows:

808.3.1 808.3.1.1 Sidelighting Daylight prescriptive requirements. The daylit area shall be illuminated by fenestration that complies with Table 808.3.1.1 and Figure 808.3.1.1(4). Where fenestration is located in a wall, the daylit area shall extend laterally to the nearest 56-inch-high (1422 mm) partition, or up to 1.0 times the height from the floor to the top of fenestration facing within 45 degrees (0.785 rad) of east or west or up to 1.5 times the height from the floor to the top of all other fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56-inch-high (1422 mm) partition, or up to 2 feet (610 mm), whichever is less, as indicated in Figure 808.3.1.1(1). Where fenestration is located in a rooftop monitor, the daylit area shall extend laterally to the nearest 56-inch-high (1422 mm) partition, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56-inch-high (1422 mm) partition, or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures 808.3.1.1(2) and 808.3.1.1(3).

Daylit areas shall comply with the following:

1. Each daylit area shall be located within a toplight or sidelight daylight zone, determined in accordance with Section C405 of the International Energy Conservation Code.
2. The effective aperture of fenestration for the *daylight zone*, determined in accordance with Equation 8-2, shall comply with Table 808.3.1.
3. Overlapping *daylight zones* shall be counted only once.

$$EA = (AF \times VT) / DA \quad \text{(Equation 8-2)}$$

where:

EA = Effective aperture.
AF = Area of fenestration.

VT = Visible transmittance of the fenestration.
DA = Daylit area.

**TABLE 808.3.1 808.3.1.1
MINIMUM EFFECTIVE APERTURE**

SKY TYPE	MINIMUM EFFECTIVE APERTURE (percentage)		
	Sidelighting from fenestration in a wall [see Figure 808.3.1.1(1)]	Sidelighting from rooftop monitor [see Figures 808.3.1.1(2) and 808.3.1.1(3)]	Toplighting (see Figure 808.3.1.2)
A ^a	40.0 12.5	5.0	1.0
B ^b	42.0 15.0	6.0	1.2
C ^c	46.0 20.0	8.0	2.2

- a. Sky Type A – more than 75 percent mean sunshine, in accordance with the NOAA Annual Mean Sunshine Percentage Table.
- b. Sky Type B – 45 percent to 75 percent mean sunshine, in accordance with the NOAA Annual Mean Sunshine Percentage Table.
- c. Sky Type C – less than 45 percent mean sunshine, in accordance with the NOAA Annual Mean Sunshine Percentage Table.

Delete without substitution:

~~**FIGURE 808.3.1.1(1)
DAYLIT AREA ADJACENT TO FENESTRATION IN A WALL**~~

~~**FIGURE 808.3.1.1(2)
DAYLIT AREA ADJACENT UNDER A ROOFTOP MONITOR**~~

~~**FIGURE 808.3.1.1(3)
DAYLIT AREA ADJACENT UNDER A ROOFTOP MONITOR**~~

~~**FIGURE 808.3.1.1(4)
SKY TYPES**~~

~~**808.3.1.2 Toplighting.** The daylit area shall be illuminated by a roof fenestration assembly such as a skylight, sloped glazing or tubular daylighting device that complies with Table 808.3.1.1 and Figure 808.3.1.2. The daylit area extends laterally and longitudinally beyond the glazed opening of the roof fenestration assembly to the nearest 56-inch-high (1422 mm) partition, or up to 0.7 times the height from the floor to the bottom of the rough opening of the daylighting well, whichever is less, as indicated in Figure 808.3.1.2.~~

~~**FIGURE 808.3.1.2
DAYLIT AREA UNDER A SKYLIGHT**~~

Revise as follows:

808.3.2 Daylight performance requirements path. Each daylit area shall comply with the requirements of either Section 808.3.2.1 or 808.3.2.2. Daylight analysis shall be conducted in accordance with Section 808.3.2.3.

Reason: CE294 AMPC1/3 will add the daylight zone definitions and diagrams from the 2012 IgCC into the 2015 IECC. CE36 AS will require that daylight zones are indicated on floor plans submitted for permit to demonstrate compliance with the lighting controls requirements in the IECC 2015. Taken together, these two code change proposals mean that the IECC 2015 now requires a relatively robust and accurate set of daylight zone determinations for all projects, and there is no reason for the IgCC to retain a duplicate set of prescriptive daylighting requirements. There are several aspects to this proposal:

1. The term "daylit area" should no longer be a defined term in the IGCC since it is so close to the term "daylight zone" in the IECC. Furthermore, the term is only used in this section and has a generally understood meaning.

2. In Equation 8-1 the requirements for a wall or roof to be obstructed have been modified to match daylight zone terminology in CE294.
3. Minimum effective aperture values for fenestration in a wall have been increased by 25% in Table 808.3.1.1 because the depth of a daylight zone in CE294 is 1.0 times the window head height, compared to 1.0 (east-west) or 1.5 (north-south) times the window head height in the IgCC 2012. This increase in the minimum effective aperture will result in the same amount and type of fenestration being required for buildings complying with the 2015 IgCC as compared to the 2012 IgCC (on average).

Cost Impact: Will not increase the cost of construction

GG263-14 : 808.3 #2-BAILEY594

GG264-14

808.3.1.1, Figure 808.3.1.1(4)

Proponent: Jack Bailey, One Lux Studio, representing International Association of Lighting Designers (jbailey@oneluxstudio.com)

Revise as follows:

808.3.1.1 Sidelighting. The daylit area shall be illuminated by fenestration that complies with Table 808.3.1.1 and ~~Figure 808.3.1.1(4)~~. Where fenestration is located in a wall, the daylit area shall extend laterally to the nearest 56-inch-high (1422 mm) partition, or up to 1.0 times the height from the floor to the top of fenestration facing within 45 degrees (0.785 rad) of east or west or up to 1.5 times the height from the floor to the top of all other fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56-inch-high (1422 mm) partition, or up to 2 feet (610 mm), whichever is less, as indicated in Figure 808.3.1.1(1). Where fenestration is located in a rooftop monitor, the daylit area shall extend laterally to the nearest 56-inch-high (1422 mm) partition, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56-inch-high (1422 mm) partition, or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures 808.3.1.1(2) and 808.3.1.1(3).

$$EA = (AF \times VT) / DA \quad \text{(Equation 8-2)}$$

where:

EA = Effective aperture.
 AF = Area of fenestration.

VT = Visible transmittance of the fenestration.
 DA = Daylit area.

**TABLE 808.3.1.1
 MINIMUM EFFECTIVE APERTURE**

SKY TYPE	MINIMUM EFFECTIVE APERTURE (percentage)		
	Sidelighting from fenestration in a wall [see Figure 808.3.1.1(1)]	Sidelighting from rooftop monitor [see Figures 808.3.1.1(2) and 808.3.1.1(3)]	Toplighting (see Figure 808.3.1.2)
^a A	10.0	5.0	1.0
^b B	12.0	6.0	1.2
^c C	16.0	8.0	2.2

- a. Sky type as determined in accordance with Section 808.4, Sky Type A—more than 75 percent mean sunshine, in accordance with the NOAA Annual Mean Sunshine Percentage Table.
- b. Sky Type B—45 percent to 75 percent mean sunshine, in accordance with the NOAA Annual Mean Sunshine Percentage Table.
- c. Sky Type C—less than 45 percent mean sunshine, in accordance with the NOAA Annual Mean Sunshine Percentage Table.

Delete without substitution:

**FIGURE 808.3.1.1(4)
 SKY TYPES**

Reason: Figure 808.3.1.1(4) is not necessary and does not offer an accurate way of determining sky types. Sky types should be determined from Section 808.4. The Figure is good supplemental information for the Commentary but should not be in the code book.

Cost Impact: Will not increase the cost of construction

GG264-14 : 808.3.1.1-BAILEY600

GG265-14

808.3.1.1

Proponent: Helen Sanders, representing SAGE Electrochromics Inc.
(helen.sanders@sageglass.com)

Revise as follows:

808.3.1.1 Sidelighting. The daylit area shall be illuminated by fenestration that complies with Table 808.3.1.1 and Figure 808.3.1.1(4). Where fenestration is located in a wall, the daylit area shall extend laterally to the nearest 56-inch-high (1422 mm) partition, or up to 1.0 times the height from the floor to the top of fenestration facing within 45 degrees (0.785 rad) of east or west or up to 1.5 times the height from the floor to the top of all other fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56-inch-high (1422 mm) partition, or up to 2 feet (610 mm), whichever is less, as indicated in Figure 808.3.1.1(1). Where fenestration is located in a rooftop monitor, the daylit area shall extend laterally to the nearest 56-inch-high (1422 mm) partition, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest 56-inch-high (1422 mm) partition, or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures 808.3.1.1(2) and 808.3.1.1(3). Vertical fenestration shall be provided with an automatically controlled method for managing glare. Such methods include automatically controlled shading devices or dynamic glazing capable of modulating in multiple steps the amount of light transmitted into the space in response to daylight levels. Control systems shall contain a manual override that shall reset to automatic control after not more than 4 hours.

$$EA = (AF \times VT) / DA$$

(Equation 8-2)

where:

EA = Effective aperture.

AF = Area of fenestration.

VT = Visible transmittance of the fenestration.

DA = Daylit area.

Reason: The purpose of this proposal is to add consideration of glare control to the prescriptive daylighting requirements of the IgCC. One goal of the IEQ section is to deliver an environment in which occupants are comfortable. Visual comfort is an important area to consider, as occupants' remedies for dealing with visual discomfort can undermine both the energy and the daylighting benefits of a good daylighting design. As such, good daylighting design will always include a dynamic response for glare. The 2012 IgCC requires daylighting for many spaces, as specified in sections 808.2 and 808.3. Within these requirements, the performance option (section 808.3.2) ensures that both daylighting and glare control are considered by setting both minimum *and* maximum illumination levels that must be met. However, under the prescriptive daylight option, there is no consideration of glare control, even though higher levels of daylight can exacerbate glare discomfort if not properly accounted for in the building design. In the presence of glare, if manual blinds are present, occupants will pull them or place objects (cardboard, paper etc.) permanently on the opening to control the glare. Once blinds are manually shut to counter a temporary glare condition, they usually remain shut the rest of the day, thus negating much of the daylighting benefit even after the sun has moved and there is no more direct glare. [references 1, 2] Therefore, to ensure the intended daylighting benefits are achieved and maintained, this proposal would add language under the prescriptive option to require vertical fenestration to include automatically controlled blinds or dynamic glazing that would respond to glare conditions. Additionally, the system shall include a manual override to allow for individual control, but is required to be reset after a certain amount of time. Alternately, the performance daylight option may be used to allow any method to achieve the same goal as long as the minimum and maximum illumination levels are met.

Bibliography:

1. D Bourgeois, C Reinhart, I Macdonald, "Adding advanced behavior models in whole building energy simulation: A study on the total energy impact of manual and automated lighting control", Energy and Buildings vol 38, #7, July 2006
2. C.F. Reinhart, "Lightswitch 2002: a model for manual control of electric lighting and blinds", Solar Energy 77(1) 2004, 15-28.

Cost Impact: Will increase the cost of construction. This proposal will increase the cost of construction when using the prescriptive daylighting path compared to the 2012 IgCC as it now requires glare control to be addressed. The performance path for daylighting already required glare control to be included (through maximum illumination), so cost is not necessarily increased in that path - it depends on the specific method (internal or external shading, dynamic glazing, etc).

GG265-14 : 808.3.1.1-SANDERS961

GG266-14

202 (New), Table 302.1, 809 (New)

Proponent: David Kapturowski, representing American Association of Radon Scientists and Technologists (dave@spruce.com)

Revise as follows:

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT			
804.2	Post-Construction Pre-Occupancy Baseline IAQ Testing	Yes	No
807.1	Sound transmission and sound levels	Yes	No
809.1	Radon for one and two family dwellings (Section 101.3.	Yes	No
	<u>Item</u> <u>1.1)</u>		

(Portions of table not shown remain unchanged.)

Add new text as follows:

SECTION 809 **RADON**

809.1 General. Where this section is indicated to be applicable in Table 302.1, *radon* control methods shall be applied to one & two family dwellings not more than three stories in height that are located within geographic areas shown to have a potential for radon gas in the soil. *Rough-ins* or complete *active soil depressurization* systems shall be installed to reduce soil gas entry and vapor intrusion so as to establish indoor *radon* levels below the *National Radon Action Level*.

809.2 Mitigation system required. A *rough-in* or complete *active soil depressurization* system shall be installed in accordance with AARST/ANSI CCAH-2013 in dwellings that are located in *radon* potential zones 1 and 2 in accordance with Section 809.3.

809.3EPA established zones. The radon potential of a building site shall be estimated from the United States Environmental Protection Agency radon potential map as shown in Figure 809.1 or from United States Environmental Protection Agency radon potential by county listing as shown in Table 809.1. Where state or local jurisdictions have published radon potential data, such data shall supersede the information in Figure 809.1 and Table 809.1.

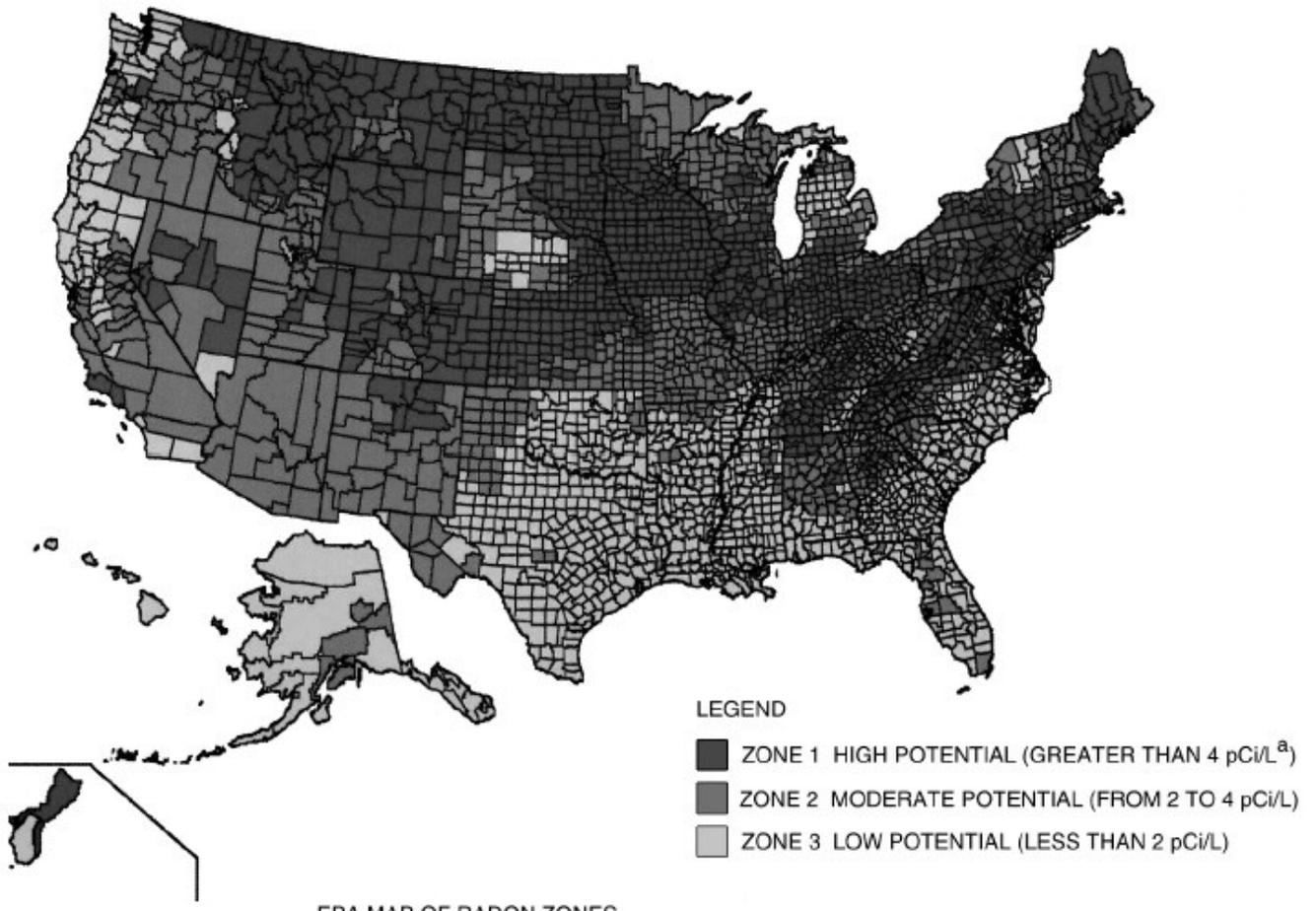


FIGURE 809.1
EPA MAP OF RADON ZONES

TABLE 809.1
EPA RADON ZONE 1 and 2 COUNTIES BY STATE^a

ALABAMA Zone 1 Calhoun	ALASKA Zone 2 Anchorage Municipality	Zone 2 Alameda Alpine	Gilpin Grand Gunnison	New Haven New London
Clay	Dillingham Census Area	Amador	Huerfano	Zone 2
Cleburne Colbert Coosa Franklin	Fairbanks North Star Borough Kenai Peninsula Borough	Calaveras Contra Costa El Dorado Fresno	Jackson Jefferson Kiowa Kit Carson	Litchfield Tolland Windham
Jackson Lauderdale Lawrence Limestone Madison Morgan	Matanuska-Susitna Borough Southeast Fairbanks Census Area	Inyo Kern Los Angeles Madera Mariposa Mono	La Plata Larimer Las Animas Lincoln Logan Mesa	DELAWARE Zone 2 New Castle
	ARIZONA			FLORIDA Zone 2

Talladega	Zone 2 Apache	Monterey Nevada	Moffat Montezuma	Alachua Citrus
Zone 2	Cochise	Placer	Montrose	Columbia
Autauga Barbour Bibb Blount Bullock Cherokee	Coconino Gila Graham Greenlee La Paz Maricopa	Plumas Riverside San Benito San Bernardino San Francisco San Luis Obispo	Morgan Otero Ouray Park Phillips Pitkin	Hillsborough Leon Marion Miami-Dade Polk Union
Chilton	Mohave	San Mateo	Prowers	
Cullman Dallas DeKalb	Navajo Pima Pinal	Santa Clara Santa Cruz Sierra	Pueblo Rio Blanco San Miguel	GEORGIA Zone 1 Cobb
Elmore	Santa Cruz	Tulare	Sedgwick	DeKalb
Etowah Fayette Greene	Yavapai Yuma	Tuolumne Yuba	Summit Teller Washington	Fulton Gwinnett
Hale Jefferson Lamar	ARKANSAS Zone 2 Baxter	COLORADO Zone 1 Adams	Weld Yuma	Zone 2 Banks Barrow
Lee	Benton	Arapahoe	Zone 2	Bartow
Lowndes Macon Marion	Boone Carroll Fulton	Baca Bent Boulder	Alamosa Archuleta Conejos	Butts Carroll Catoosa
Marshall	Garland	Broomfield	Costilla	Cherokee
Montgomery Perry Pickens	Independence Izard Marion	Chaffee Cheyenne Clear Creek	Eagle Hinsdale Lake	Clarke Clayton Coweta
Randolph Russell Shelby	Montgomery Randolph Searcy	Crowley Custer Delta	Mineral Rio Grande Routt	Dawson Douglas Elbert
St Clair	Sharp	Denver	Saguache	Fannin
Sumter Tuscaloosa Walker	Stone	Dolores Douglas El Paso	San Juan	Fayette Floyd Forsyth
Winston	CALIFORNIA Zone 1	Elbert	CONNECTICUT Zone 1	Franklin
	Santa Barbara Ventura	Fremont Garfield	Fairfield Middlesex	Gilmer Greene
Habersham	Idaho	Jersey	Hardin	Hendricks
Hall Haralson Harris	Kootenai Latah Lemhi	Jo Daviess Kane Kendall	Jackson Jasper Jefferson	Henry Howard Huntington
Hart	Shoshone	Knox	Johnson	Jay
Heard Henry	Valley	LaSalle Lee	Kankakee Lake	Jennings Johnson

Jackson Jasper	Zone 2 Ada	Livingston Logan	Lawrence Macoupin	Kosciusko LaGrange
Lamar	Bannock	Macon	Madison	Lawrence
Lumpkin Madison Meriwether Monroe Morgan Newton	Bear Lake Bingham Bonneville Canyon Caribou Cassia	Marshall Mason McDonough McLean Menard Mercer	Marion McHenry Monroe Montgomery Perry Pope	Madison Marion Marshall Miami Monroe Montgomery
Oconee	Franklin	Morgan	Randolph	Noble
Oglethorpe Paulding Pickens	Jefferson Jerome Lincoln	Moultrie Ogle Peoria	Richland Saline Shelby	Orange Putnam Randolph
Pike	Madison	Piatt	St Clair	Rush
Rabun Richmond Rockdale	Minidoka Oneida Owyhee	Pike Putnam Rock Island	Union Wabash Washington	Scott Shelby St Joseph
Spalding Stephens Talbot	Payette Power Teton	Sangamon Schuyler Scott	Wayne White Will	Steuben Tippecanoe Tipton
Towns	Twin Falls	Stark	Williamson	Union
Troup Union Upson	ILLINOIS Zone 1	Stephenson Tazewell Vermilion	INDIANA Zone 1	Vermillion Wabash Warren
Walker	Adams	Warren	Adams	Washington
Walton White Whitfield	Boone Brown Bureau	Whiteside Winnebago Woodford	Allen Bartholomew Benton	Wayne Wells White
IDAHO Zone 1	Calhoun Carroll Cass	Zone 2 Bond	Blackford Boone Carroll	Whitley Zone 2
Benewah	Champaign	Christian	Cass	Brown
Blaine Boise Bonner	Coles De Kalb De Witt	Clark Clay Clinton	Clark Clinton De Kalb	Clay Crawford Daviess
Boundary	Douglas	Cook	Decatur	Dearborn
Butte Camas	Edgar Ford	Crawford Cumberland	Delaware Elkhart	Dubois Floyd
Clark	Fulton	DuPage	Fayette	Franklin
Clearwater Custer Elmore	Greene Grundy Hancock	Edwards Effingham Fayette	Fountain Fulton Grant	Gibson Greene Jackson
Fremont	Henderson	Franklin	Hamilton	Jasper
Gooding	Henry Iroquois	Gallatin Hamilton	Hancock Harrison	Jefferson Knox

Lake LaPorte	Des Moines Dickinson	Sac Scott	Lincoln Logan	Elk Franklin
Martin	Dubuque	Shelby	Marion	Greenwood
Morgan Newton Ohio Owen Parke Perry	Emmet Fayette Floyd Franklin Fremont Greene	Sioux Story Tama Taylor Union Van Buren	Marshall McPherson Meade Mitchell Nemaha Ness	Harper Harvey Jefferson Labette Linn Lyon
Pike	Grundy	Wapello	Norton	Miami
Porter Posey Pulaski	Guthrie Hamilton Hancock	Warren Washington Wayne	Osborne Ottawa Pawnee	Montgomery Morris Morton
Ripley	Hardin	Webster	Phillips	Neosho
Spencer Starke Sullivan	Harrison Henry Howard	Winnebago Winneshiek Woodbury	Pottawatomie Pratt Rawlins	Osage Reno Sedgwick
Switzerland Vanderburgh Vigo	Humboldt Ida Iowa	Worth Wright	Republic Rice Riley	Seward Shawnee Stafford
Warrick	Jackson	KANSAS	Rooks	Stevens
IOWA Zone 1	Jasper Jefferson Johnson	Zone 1 Atchison Barton	Rush Russell Saline	Sumner Wabaunsee Wilson
Adair	Jones	Brown	Scott	Woodson
Adams Allamakee Appanoose	Keokuk Kossuth Lee	Cheyenne Clay Cloud	Sheridan Sherman Smith	KENTUCKY Zone 1
Audubon Benton Black Hawk	Linn Louisa Lucas	Decatur Dickinson Douglas	Stanton Thomas Trego	Adair Allen Barren
Boone	Lyon	Ellis	Wallace	Bourbon
Bremer Buchanan Buena Vista	Madison Mahaska Marion	Ellsworth Finney Ford	Washington Wichita Wyandotte	Boyle Bullitt Casey
Butler	Marshall	Geary		Clark
Calhoun Carroll	Mills Mitchell	Gove Graham	Zone 2 Allen	Cumberland Fayette
Cass	Monona	Grant	Anderson	Franklin
Cedar Cerro Gordo Cherokee	Monroe Montgomery Muscatine	Gray Greeley Hamilton	Barber Bourbon Butler	Green Harrison Hart
Chickasaw	O'Brien	Haskell	Chase	Jefferson
Clarke Clay	Osceola Page	Hodgeman Jackson	Chautauqua Cherokee	Jessamine Lincoln

Clayton Clinton	Palo Alto Plymouth	Jewell Johnson	Clark Coffey	Marion Mercer
Crawford	Pocahontas	Kearny	Comanche	Metcalfe
Dallas Davis Decatur Delaware Robertson Russell	Polk Pottawattamie Poweshiek Ringgold Letcher Lewis	Kingman Kiowa Lane Leavenworth York Zone 2	Cowley Crawford Doniphan Edwards Jackson Kalamazoo	Monroe Nelson Pendleton Pulaski Douglas Faribault Count
Scott	Livingston	Knox	Lenawee	Fillmore
Taylor Warren Woodford	Logan Lyon Madison	Sagadahoc Waldo Washington	St Joseph Washtenaw	Freeborn Goodhue Grant
	Magoffin		Zone 2	Hennepin
Zone 2 Anderson Bath	Martin Mason McCreary	MARYLAND Zone 1 Baltimore	Alcona Alger Alpena	Houston Hubbard Jackson
Bell Boone Boyd	McLean Meade Meniffee	Calvert Carroll Frederick	Antrim Baraga Barry	Kanabec Kandiyohi Kittson
Bracken	Montgomery	Harford	Charlevoix	Lac qui Parle
Breathitt Breckinridge Butler	Morgan Muhlenberg Nicholas	Howard Montgomery Washington	Clinton Dickinson Eaton	Le Sueur Lincoln Lyon
Caldwell	Ohio		Emmet	Mahnomen
Campbell Carroll Carter	Oldham Owen Owsley	Zone 2 Allegany Anne Arundel	Genesee Gogebic Houghton	Marshall Martin McLeod
Christian Clay Clinton	Perry Pike Powell	Baltimore City Cecil Charles	Ingham Ionia Iron	Meeker Mower Murray
Crittenden	Rockcastle	Garrett	Kent	Nicollet
Daviess Edmonson Elliott	Rowan Shelby Simpson	Prince George's Somerset	Keweenaw Lapeer Leelanau	Nobles Norman Olmsted
Estill	Spencer	MASSACHUSETTS	Livingston	Otter Tail
Fleming Floyd	Todd Trigg	Zone 1 Essex	Marquette Menominee	Pennington Pipestone
Gallatin	Trimble	Middlesex	Monroe	Polk
Garrard Grant Grayson	Union Washington Wayne	Worcester Zone 2	Montcalm Montmorency Oakland	Pope Ramsey Red Lake
Greenup	Webster	Barnstable	Otsego	Redwood
Hancock Hardin	Whitley Wolfe	Berkshire Bristol	Presque Isle Sanilac	Renville Rice

Harlan Henderson	MAINE	Dukes Franklin	Shiawassee	Rock Roseau
Henry	Zone 1	Hampden	MINNESOTA	Scott
Hopkins Jackson Johnson Kenton Knott Knox	Androscoggin Aroostook Cumberland Franklin Hancock Kennebec	Hampshire Nantucket Norfolk Plymouth	Zone 1 Becker Big Stone Blue Earth Brown Carver	Sherburne Sibley Stearns Steele Stevens Swift
Larue	Lincoln	Zone 1	Chippewa	Todd
Laurel Lawrence Lee	Oxford Penobscot Piscataquis	Branch Calhoun Cass	Clay Cottonwood Dakota	Traverse Wabasha Wadena
Leslie	Somerset	Hillsdale	Dodge	Waseca
Washington Watowan Wilkin	Nodaway Platte	Macon Madison Maries	Beaverhead Big Horn Blaine	Musselshell Petroleum Sweet Grass
Winona Wright Yellow Medicine	Zone 2 Adair Audrain	Marion McDonald Mercer	Broadwater Carbon Carter	Treasure Wheatland Yellowstone
	Barry	Miller	Cascade	
Zone 2 Aitkin Anoka	Barton Bates Benton	Moniteau Monroe Montgomery	Chouteau Custer Daniels	NEBRASKA Zone 1 Adams
Beltrami	Bollinger	Morgan	Dawson	Boone
Benton Carlton Cass	Boone Caldwell Callaway	Newton Oregon Osage	Deer Lodge Fallon Fergus	Boyd Burt Butler
Chisago Clearwater Cook	Camden Cape Girardeau Carroll	Ozark Perry Pettis	Flathead Gallatin Garfield	Cass Cedar Clay
Crow Wing	Carter	Phelps	Glacier	Colfax
Isanti Itasca Koochiching	Cedar Chariton Christian	Pike Polk Pulaski	Granite Hill Jefferson	Cuming Dakota Dixon
Lake	Clark	Putnam	Judith Basin	Dodge
Lake of the Woods	Cole	Ralls	Lake	Douglas
Mille Lacs	Cooper	Randolph	Lewis and Clark	Fillmore
Morrison Pine St Louis	Crawford Dade Dallas	Ray Reynolds Ripley	Liberty Lincoln Madison	Franklin Frontier Furnas
	Daviess	Saline	McCone	Gage
MISSISSIPPI Zone 2	DeKalb Dent	Schuyler Scotland	Meagher Mineral	Gosper Greeley

Alcorn Chickasaw	Douglas Franklin	Shannon Shelby	Missoula Park	Hamilton Harlan
Clay	Gasconade	St Charles	Phillips	Hayes
Lee Lowndes Noxubee Pontotoc Rankin Union	Gentry Greene Grundy Harrison Henry Hickory	St Clair St Francois St Louis city St Louis Ste Genevieve Stone	Pondera Powder River Powell Prairie Ravalli Richland	Hitchcock Jefferson Johnson Kearney Knox Lancaster
Washington	Howard	Sullivan	Roosevelt	Madison
MISSOURI Zone 1	Howell Jasper Jefferson	Taney Texas Vernon	Rosebud Sanders Sheridan	Nance Nemaha Nuckolls
Andrew	Johnson	Warren	Silver Bow	Otoe
Atchison Buchanan Cass	Knox Laclede Lafayette	Washington Wayne Webster	Stillwater Teton Toole	Pawnee Phelps Pierce
Clay Clinton Holt	Lawrence Lewis Lincoln	Worth Wright	Valley Wibaux	Platte Polk Red Willow
Iron	Linn	MONTANA	Zone 2	Richardson
Jackson Sarpy Saunders	Livingston Esmeralda Humboldt	Zone 1 Taos Zone 2	Golden Valley Putnam Rensselaer	Saline Gaston Graham
Seward	Nye	Catron	Schoharie	Haywood
Stanton Thayer Thurston	Storey Washoe	Chaves Cibola Curry	Schuyler Seneca Steuben	Iredell Jackson Lincoln
Washington Wayne Webster	NEW HAMPSHIRE Zone 1 Carroll	De Baca Dona Ana Eddy	Sullivan Tioga Tompkins	Macon Madison McDowell
York		Grant	Ulster	Polk
Zone 2 Antelope	Zone 2 Belknap Cheshire	Guadalupe Harding Hidalgo	Washington Wyoming Yates	Rutherford Stokes Surry
Banner	Coos	Lea		Swain
Box Butte Buffalo	Grafton Hillsborough	Lincoln Los Alamos	Zone 2 Clinton	Vance Wake
Chase	Merrimack	Luna	Jefferson	Warren
Cheyenne Custer Dawes	Rockingham Strafford Sullivan	McKinley Otero Quay	Lewis Monroe Montgomery	Wilkes Yadkin Yancey
Dawson		Roosevelt	Niagara	
Deuel	NEW JERSEY	San Juan	Oneida	NORTH DAKOTA

Dundy Hall	Zone 1 Hunterdon	Sandoval Sierra	Orleans Oswego	Zone 1 Adams
Howard	Mercer	Socorro	Saratoga	Barnes
Keith Keya Paha Kimball Merrick Morrill	Monmouth Morris Somerset Sussex Warren	Torrance Union Valencia NEW YORK	Schenectady St Lawrence Wayne NORTH CAROLINA	Benson Billings Bottineau Bowman Burke
Perkins Scotts Bluff Sheridan Sherman	Zone 2 Bergen Burlington	Zone 1 Albany Allegany Broome	Zone 1 Allegheny Buncombe Cherokee	Burleigh Cass Cavalier Dickey
Sioux	Camden	Cattaraugus	Henderson	Divide
Valley	Cumberland Essex	Cayuga Chautauqua	Mitchell Rockingham	Dunn Eddy
NEVADA Zone 1 Carson City Douglas	Gloucester Hudson Middlesex Passaic	Chemung Chenango Columbia Cortland	Transylvania Watauga Zone 2	Emmons Foster Golden Valley Grand Forks
Eureka	Salem	Delaware	Alexander	Grant
Lander Lincoln Lyon	Union NEW MEXICO	Dutchess Erie Genesee	Ashe Avery Burke	Griggs Hettinger Kidder
Mineral	Zone 1	Greene	Caldwell	LaMoure
Pershing White Pine	Bernalillo Colfax	Livingston Madison	Caswell Catawba	Logan McHenry
	Mora	Onondaga	Clay	McIntosh
Zone 2 Churchill Elko	Rio Arriba San Miguel Santa Fe	Ontario Orange Otsego	Cleveland Forsyth Franklin	McKenzie McLean Mercer
Morton	Huron	Morgan	Adams	Crawford
Mountrail Nelson Oliver	Jefferson Knox Licking	Noble Ottawa Paulding	Allegheny Armstrong Beaver	Elk Erie Fayette
Pembina	Logan	Portage	Bedford	Forest
Pierce Ramsey	Madison Marion	Putnam Sandusky	Berks Blair	Greene Jefferson
Ransom	Mercer	Scioto	Bradford	Lawrence
Renville Richland Rolette	Miami Montgomery Morrow	Trumbull Vinton Washington	Bucks Butler Cameron	McKean Mercer Pike
Sargent	Muskingum	Williams	Carbon	Potter
Sheridan Sioux	Perry Pickaway	Wood	Centre Chester	Somerset Warren

Slope Stark	Pike Preble	OKLAHOMA Zone 2	Clarion Clearfield	Washington Wayne
Steele	Richland	Adair	Clinton	
Stutsman Towner Traill Walsh Ward Wells	Ross Seneca Shelby Stark Summit Tuscarawas	Beaver Cherokee Cimarron Delaware Ellis Mayes	Columbia Cumberland Dauphin Delaware Franklin Fulton	RHODE ISLAND Zone 1 Kent Washington Zone 2
Williams	Union	Sequoyah	Huntingdon	Newport
OHIO Zone 1	Van Wert Warren Wayne	Texas OREGON	Indiana Juniata Lackawanna	Providence SOUTH CAROLINA
Adams Allen	Wyandot	Zone 2 Baker	Lancaster Lebanon	Zone 1 Greenville
Ashland Auglaize Belmont Butler	Zone 2 Ashtabula Athens Brown	Clatsop Columbia Crook Gilliam	Lehigh Luzerne Lycoming Mifflin	Zone 2 Abbeville Anderson
Carroll	Clermont	Grant	Monroe	Cherokee
Champaign Clark Clinton	Cuyahoga Defiance Erie	Harney Hood River Jefferson	Montgomery Montour Northampton	Laurens Oconee Pickens
Columbiana	Fulton	Klamath	Northumberland	Spartanburg
Coshocton Crawford	Gallia Geauga	Lake Malheur	Perry Schuylkill	York
Darke Delaware Fairfield	Henry Highland Hocking	Morrow Multnomah Sherman	Snyder Sullivan Susquehanna	SOUTH DAKOTA Zone 1 Aurora
Fayette	Jackson	Umatilla	Tioga	Beadle
Franklin Greene Guernsey	Lake Lawrence Lorain	Union Wasco Washington	Union Venango Westmoreland	Bon Homme Brookings Brown
Hamilton	Lucas	Wheeler	Wyoming	Brule
Hancock Hardin	Mahoning Medina	Yamhill	York	Buffalo Campbell
Harrison	Meigs	PENNSYLVANIA	Zone 2	Charles Mix
Holmes Clay Codrington	Monroe Mellette Pennington	Zone 1 Carter Cheatham	Cambria Hutchinson Jeff Davis	Clark Wayne Weber
Corson	Shannon	Chester	Lamb	
Davison Day Deuel	Todd Tripp Ziebach	Clay Cocke Coffee	Lipscomb Llano Lubbock	VERMONT Zone 2 Addison

Douglas Edmunds	TENNESSEE	Decatur DeKalb	Lynn Mason	Bennington Caledonia
Faulk	Zone 1	Dickson	Moore	Essex
Grant Hamlin Hand Hanson Hughes Hutchinson	Anderson Bedford Blount Bradley Claiborne Davidson	Fentress Hamilton Hardin Henderson Houston Johnson	Ochiltree Oldham Parmer Potter Presidio Randall	Franklin Lamoille Orange Orleans Rutland Washington
Hyde	Giles	Marion	Reeves	Windham
Jerauld Kingsbury Lake	Grainger Greene Hamblen	McNairy Montgomery Overton	Roberts Sherman Swisher	Windsor VIRGINIA
Lincoln	Hancock	Pickett	Terrell	Zone 1
Lyman Marshall McCook	Hawkins Hickman Humphreys	Polk Putnam Robertson	UTAH Zone 1	Alleghany Amelia Appomattox
McPherson Miner Minnehaha	Jackson Jefferson Knox	Sevier Stewart Sumner	Carbon Duchesne Grand	Augusta Bath Bland
Moody	Lawrence	Unicoi	Piute	Botetourt
Perkins Potter Roberts	Lewis Lincoln Loudon	Van Buren Warren White	Sanpete Sevier Uintah	Brunswick Buckingham Campbell
Sanborn	Macon			Chesterfield
Spink Stanley Sully	Madison Marshall McMinn	TEXAS Zone 2 Armstrong	Zone 2 Beaver Box Elder	Clarke Craig Cumberland
Turner Union Walworth	Meigs Monroe Moore	Bailey Brewster Carson	Cache Daggett Davis	Dinwiddie Fairfax Fluvanna
Yankton	Perry	Castro	Emery	Frederick
Zone 2 Bennett	Roane Rutherford Smith	Crosby Culberson Dallam	Garfield Iron Juab	Giles Goochland Henry
Butte	Sullivan	Deaf Smith	Kane	Highland
Custer Dewey	Trousdale Union	Donley Floyd	Millard Morgan	Lee Louisa
Fall River	Washington	Garza	Rich	Montgomery
Gregory Haakon Harding	Wayne Williamson Wilson	Gray Hale Hansford	Salt Lake San Juan Summit	Nottoway Orange Page
Jackson		Hartley	Tooele	Patrick
Jones Lawrence	Zone 2 Benton	Hemphill Hockley	Utah Wasatch	Pittsylvania Powhatan

Meade Roanoke	Cannon Pend Oreille	Hudspeth Barbour	Washington Marathon	Pulaski Oneida
Rockbridge	Skamania	Braxton	Menominee	Outagamie
Rockingham Russell Scott Shenandoah Smyth Spotsylvania	Spokane Stevens Zone 2 Adams Asotin	Cabell Calhoun Clay Doddridge Fayette Gilmer	Pepin Pierce Portage Richland Rock Shawano	Ozaukee Polk Price Racine Rusk Sauk
Stafford	Benton	Harrison	St Croix	Sawyer
Tazewell Warren Washington	Columbia Douglas Franklin	Jackson Lewis Lincoln	Vernon Walworth Washington	Sheboygan Taylor Trempealeau
Wythe	Garfield	Marion	Waukesha	Vilas
Zone 2 Albamarle	Grant Kittitas Klickitat	Mason Nicholas Pleasants	Waupaca Wood	Washburn Waushara Winnebago
Amherst Arlington Bedford	Lincoln Walla Walla Whitman	Putnam Raleigh Randolph	Zone 2 Adams Ashland	WYOMING Zone 1
Buchanan	Yakima	Ritchie	Barron	Albany
Carroll Charlotte Culpeper	WEST VIRGINIA Zone 1	Roane Taylor Tucker	Bayfield Brown Burnett	Big Horn Campbell Carbon
Dickenson	Berkeley	Tyler	Calumet	Converse
Fauquier Floyd Franklin	Brooke Grant Greenbrier	Upshur Wayne Webster	Chippewa Clark Columbia	Crook Fremont Goshen
Grayson Greene Halifax	Hampshire Hancock Hardy	Wirt Wood	Douglas Dunn Eau Claire	Hot Springs Johnson Laramie
Loudoun	Jefferson	WISCONSIN	Florence	Lincoln
Lunenburg Madison Mecklenburg	Marshall Mercer Mineral	Zone 1 Buffalo Crawford	Forest Iron Jackson	Natrona Niobrara Park
Nelson	Monongalia	Dane	Juneau	Sheridan
Prince Edward Prince William	Monroe Morgan	Dodge Door	Kenosha Kewaunee	Sublette Sweetwater
Rappahannock	Ohio	Fond du Lac	La Crosse	Teton
Wise	Pendleton Pocahontas Preston	Grant Green Green Lake	Lincoln Manitowoc Marinette	Uinta Washakie
WASHINGTON Zone 1	Summers	Iowa	Marquette	Zone 2
Clark Ferry	Wetzel	Jefferson Lafayette	Milwaukee Monroe	Platte Weston

Okanogan	Zone 2	Langlade	Oconto	
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Add new definitions as follows:

**SECTION 202
DEFINITIONS**

ACTIVE SOIL DEPRESSURIZATION (ASD). A family of radon mitigation systems involving fan-powered soil depressurization, including, but not limited to, sub-slab depressurization and sub-membrane depressurization.

NATIONAL ACTION LEVEL. The indoor radon concentration at which mitigation is recommended. The national action level is defined as the US Environmental Protection Agency's Action Level of 4 pCi/L [148 Bq/m3].

RADON. A naturally occurring, chemically inert, radioactive element, Rn-222, that exists as a gas.

ROUGH-IN. The installation of all parts and materials of an active soil depressurization system (ASD) that must be completed prior to the placement of concrete, prior to the closure of building cavities and prior to the installation of finish materials. Such parts and materials are gas permeable layers, soil gas retarders, plenums, membranes, piping, suction points, discharge point and wiring.

Add new standard(s) as follows:

AARST/ANSI

CCA-2013 Reducing Radon in New Construction of 1 & 2 Family Dwellings and Townhouses

Reason: Radon is an important Life/Safety issue which exists in residential construction because of the way homes are constructed and the soil underlying a dwelling's foundation. **Occupant sustainability must be the primary goal for Green Building** but the IgCC currently only contains provisions for radon in the voluntary Appendix B.

21,000 Americans die each year from radon-induced lung cancer. Geographical areas of the highest radon potential in the United States are located in EPA radon zones 1 & 2. This proposal adds radon control features and requires radon testing prior to occupancy to ensure radon levels below the National Radon Action Level of 4 pCi/L.

The EPA estimates that 1 out of 15 of all homes in the US has elevated indoor radon levels. The incidence of elevated radon may be greater than 7 out of 10 homes in some high radon areas. Nonrandomized industry data shows a significant number of homes across the United States have tested high for elevated indoor radon concentrations.

Radon Test Results Data by State

STATE	STATENAME	TOTAL # TESTS	AVG (pCi/L)	% > EPA Action Level of 4 pCi/L
AL	ALABAMA	11,629	3.8	21.9
AK	ALASKA	432	2.2	13.0
AZ	ARIZONA	7,495	2.1	11.9
AR	ARKANSAS	1,243	2.5	13.7
CA	CALIFORNIA	16,960	2.1	9.1
CO	COLORADO	88,346	6.5	49.0
CT	CONNECTICUT	41,292	3.4	23.9
DE	DELAWARE	5,539	2.5	17.4
FL	FLORIDA	40,039	1.8	10.2
GA	GEORGIA	27,222	2.6	18.9
HI	HAWAII	94	0.4	2.1
ID	IDAHO	16,138	7.1	40.4
IL	ILLINOIS	84,366	5.1	41.0
IN	INDIANA	18,031	4.7	37.2
IA	IOWA	96,260	6.2	49.3
KS	KANSAS	34,288	5.2	44.0

STATE	STATENAME	TOTAL # TESTS	AVG (pCi/L)	% > EPA Action Level of 4 pCi/L
KY	KENTUCKY	47,575	7.4	43.6
LA	LOUISIANA	786	0.9	3.1
ME	MAINE	5,494	5.9	38.3
MD	MARYLAND	55,949	5.4	33.4
MA	MASSACHUSETTS	29,850	3.8	25.6
MI	MICHIGAN	164,678	3.4	25.4
MN	MINNESOTA	135,419	4.7	42.2
MS	MISSISSIPPI	700	1.2	5.6
MO	MISSOURI	27,771	4.2	31.6
MT	MONTANA	18,082	7.2	46.3
NE	NEBRASKA	27,481	5.7	51.6
NV	NEVADA	1,952	3.0	19.3
NH	NEW HAMPSHIRE	35,974	5.5	34.0
NJ	NEW JERSEY	41,092	4.3	24.1
NM	NEW MEXICO	8,165	3.9	30.2
NY	NEW YORK	66,713	4.8	23.9
NC	NORTH CAROLINA	79,384	3.8	27.5
ND	NORTH DAKOTA	10,887	6.0	50.5
OH	OHIO	102,352	7.9	49.0
OK	OKLAHOMA	1,356	2.3	9.7
OR	OREGON	13,675	3.5	25.4
PA	PENNSYLVANIA	149,543	8.3	44.3
RI	RHODE ISLAND	8,667	4.2	31.0
SC	SOUTH CAROLINA	38,971	2.7	18.7
SD	SOUTH DAKOTA	4,081	9.8	59.2
TN	TENNESSEE	40,632	4.6	31.8
TX	TEXAS	5,821	2.4	8.7
UT	UTAH	14,636	4.5	33.6
VT	VERMONT	3,231	3.7	23.4
VA	VIRGINIA	62,577	3.5	25.4
WA	WASHINGTON	22,199	7.0	39.3
DC	WASHINGTON DC	6,948	1.6	8.8
WV	WEST VIRGINIA	14,976	6.0	35.0
WI	WISCONSIN	72,694	5.6	41.8
WY	WYOMING	25,090	5.2	39.6
TOTALS		1,834,775		

Source: AARST radon industry test data; published 10/29/2012.

Cost Impact: Will increase the cost of construction. This change proposal will slightly increase the cost of construction. Most homes can be built with only a mitigation system Rough-In. If the home tests high for elevated radon then the system can be upgraded with a fan to reduce the indoor radon levels. Cost of mitigation system Rough-In (passive) = \$296*. Cost of fan driven mitigation system = \$707* (total cost, not in addition to \$296)

***Source: Annual Builder Practices Report 2011, NAHB Research Center, Inc.**

The cost savings for reduced health care resulting from a healthier indoor environment has not been calculated.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

A review of the standard proposed for inclusion in the code, AARST/ANSI #CCAH-2013 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GG266-14 : 809 (NEW)-KAPTUROWSKI679

GG267-14
202, 809 (New), Appendix B

Proponent: Jane Malone, National Center for Healthy Housing, representing National Center for Healthy Housing (jmalone@nchh.org); Yianice Hernandez (yhernandez@enterprisecommunity.org)

Add new definitions as follows:

SECTION 202
DEFINITIONS

DRAIN TILE LOOP. A continuous length of drain tile or perforated pipe extending around all or part of the internal or external perimeter of a basement or crawl space footing.

RADON GAS. A naturally occurring, chemically inert, radioactive gas found in soil that is not detectable by human senses.

SOIL-GAS-RETARDER. A continuous membrane of 6-mil (0.15 mm) polyethylene or other equivalent material used to retard the flow of soil gases into a building.

SUBMEMBRANE DEPRESSURIZATION SYSTEM. A system designed to achieve lower-submembrane air pressure relative to crawl space air pressure by use of a vent drawing air from beneath the soil-gas-retarder membrane.

SUBSLAB DEPRESSURIZATION SYSTEM (Active). A system designed to achieve lower subslab air pressure relative to indoor air pressure by use of a fan-powered vent drawing air from beneath the slab.

SUBSLAB DEPRESSURIZATION SYSTEM (Passive). A system designed to achieve lower subslab air pressure relative to indoor air pressure by use of a vent pipe routed through the conditioned space of a building and connecting the subslab area with outdoor air, thereby relying on the convective flow of air upward in the vent to draw air from beneath the slab.

Revise as follows:

B101-809
GENERAL-RADON

B101-809.1 Radon mitigation. Buildings in areas of High and Moderate Radon Potential (Zone 1 and 2), as determined by Figure 809.1 B101.4 and Table 809.1 B101.4 shall comply with Sections 809.2.1 B201.1 through 809.2.12 B201.10.

TABLE B101-809.1
EPA RADON ZONE 1 and 2 COUNTIES BY STATE^a

(Portions of table not shown remain unchanged.)

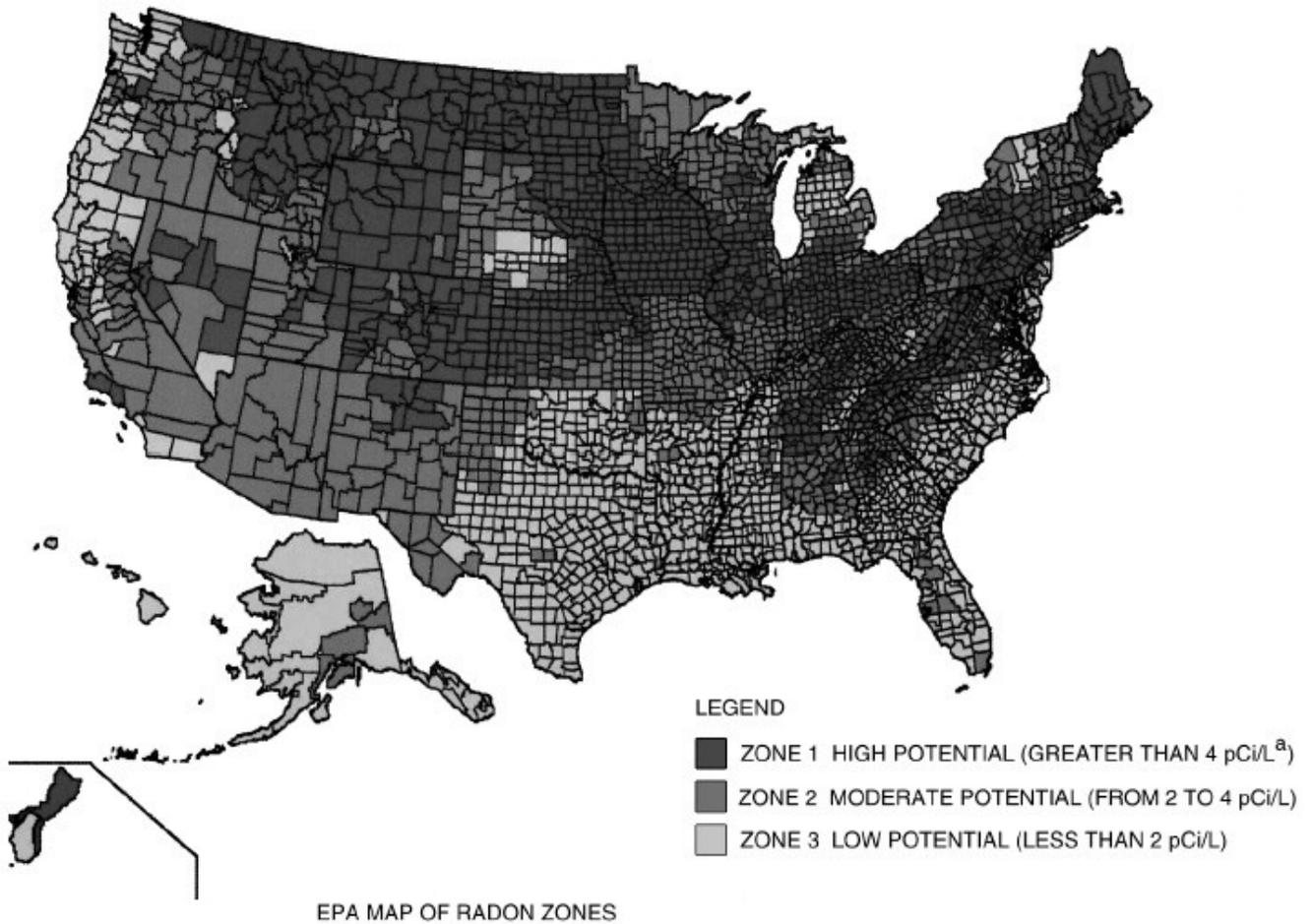


FIGURE B101.1 FIGURE 809.1
EPA MAP OF RADON ZONES

Delete without substitution:

SECTION B102
DEFINITIONS

~~DRAIN TILE LOOP.~~ A continuous length of drain tile or perforated pipe extending around all or part of the internal or external perimeter of a basement or crawl space footing.

~~RADON GAS.~~ A naturally occurring, chemically inert, radioactive gas found in soil that is not detectable by human senses.

~~SOIL-GAS-RETARDER.~~ A continuous membrane of 6-mil (0.15 mm) polyethylene or other equivalent material used to retard the flow of soil gases into a building.

~~SUBMEMBRANE DEPRESSURIZATION SYSTEM.~~ A system designed to achieve lower submembrane air pressure relative to crawl space air pressure by use of a vent drawing air from beneath the soil-gas-retarder membrane.

~~SUBLAB DEPRESSURIZATION SYSTEM (Active).~~ A system designed to achieve lower subslab air pressure relative to indoor air pressure by use of a fan-powered vent drawing air from beneath the slab.

SUBLAB DEPRESSURIZATION SYSTEM (Passive). ~~A system designed to achieve lower subslab air pressure relative to indoor air pressure by use of a vent pipe routed through the conditioned space of a building and connecting the subslab area with outdoor air, thereby relying on the convective flow of air upward in the vent to draw air from beneath the slab.~~

Revise as follows:

B201-809.2 Mitigation procedures. Radon mitigation features shall be provided in accordance with Sections 809.2.1 through 809.2.12.

B201.1-809.2.1 Subfloor preparation. A layer of gas-permeable material shall be placed under all concrete slabs and other floor systems that directly contact the ground and that are within the walls of the occupied spaces of the building, as a prerequisite for passive and active subslab depressurization systems. The gas-permeable layer shall consist of one of the following:

1. A uniform layer of clean aggregate, not less than 4 inches (102 mm) in thickness. The aggregate shall consist of material that will pass through a 2-inch (51 mm) sieve and be retained by a $1/2$ -inch (12.7mm) sieve. Size 5, 56 or 6 aggregate shall be used and shall meet the specifications of ASTM C 33. Where compaction is required or practiced, a geotextile fabric or reinforced vapor retarder shall be used beneath the aggregate to prevent fines and soil from being introduced into the aggregate.
2. A uniform layer of sand (native or fill), not less than 4 inches (102 mm) in thickness, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.
3. Geotextile drainage matting, or other materials, systems or floor designs with demonstrated capability to permit depressurization across the entire subfloor area.

B201.2-809.2.2 Subslab radon suction pit. A radon suction pit without aggregate shall be installed in the center of each 100,000 square feet (9390 m²) of floor area that is in contact with the earth and that has no subslab barriers. The suction pit void area shall be not less than 4 square feet (0.371 m²) and the pit shall be not less than 8 inches (203 mm) in depth. The resulting suction pit void to aggregate interface shall be 7 square feet (0.65 m²), or 30 times the cross sectional area of a 6-inch (157.4 mm) radon vent pipe. Alternatively, a concrete drainage distribution box or similar structure meeting the 30:1 ratio shall be employed.

The suction pit shall be covered with $3/4$ -inch-thick (19.05 mm) pressure-treated plywood or an equivalent material prior to pouring the slab. The section of slab covering the suction pit shall be reinforced.

B201.3-809.2.3 Radon vent piping. Radon vent piping shall be not less than 6 inches (157.4 mm) in diameter and constructed of PVC or equivalent gas-tight pipe.

B201.3.1-809.2.3.1 Subslab suction pit horizontal vent pipe. A section of vent pipe not less than 5 feet (1.52 m) in length shall be placed in the aggregate and shall enter the suction pit horizontally. One end of the vent pipe shall be placed so as to terminate midway in the suction pit. The vent pipe shall be supported at the boundary of the aggregate-void space so as to maintain its position. The horizontal pipe run shall provide positive condensation drainage to the suction pit with a pitch of not less than $1/8$ inch per foot (13 mm per meter).

B201.3.2-809.2.3.2 Subslab suction pit vertical vent pipe. A 90-degree (1.57 rad) elbow shall be installed on the end of the vent pipe in the aggregate. A section of vent pipe shall be connected to the elbow and shall pass vertically through and above the slab to a height of not less than 2 feet (610 mm), and shall be covered with a temporary cap. A pipe sleeve or coupling extending through the full

depth of the slab shall be used to protect the vent pipe where it passes through the slab, and the slab penetration shall be sealed in accordance with Section 809.2.5 B201.5.

~~B201.4~~ 809.2.4 Soil-gas-retarder. A minimum 6-mil (0.15 mm) [or 3-mil (0.075 mm) cross-laminated] polyethylene or equivalent flexible sheeting material that conforms to ASTM E 1643 shall be placed on top of the gas-permeable layer prior to casting the slab or placing the floor assembly to serve as a soil-gas-retarder by bridging any cracks that develop in the slab or floor assembly and to prevent concrete from entering the void spaces in the aggregate base material. The sheeting shall cover the entire floor area with separate sections of sheeting lapped at least 12 inches (305 mm). The sheeting shall fit closely around any pipe, wire or other penetrations of the material. All punctures or tears in the material shall be sealed or covered with additional sheeting having an overlap of not less than 12 inches (305 mm) on all sides.

~~B201.5~~ 809.2.5 Entry routes. Potential radon entry routes shall be sealed or closed in accordance with Sections 809.2.5.1 B201.5.1 through 809.2.5.10 B201.5.10.

~~B201.5.1~~ 809.2.5.1 Floor openings. Piping and other penetrations through concrete slabs or other floor assemblies shall be filled or sealed with a polyurethane caulk or equivalent sealant that complies with ASTM C 920 Class 25 or greater and is applied in accordance with the manufacturer's recommendations. Prior to sealing, backer rods shall be used to fill gaps greater than $\frac{1}{2}$ inch (12.7 mm).

~~B201.5.2~~ 809.2.5.2 Concrete joints. Slab joints, control saw joints, isolation joints, construction joints, pour joints, floor and wall intersection joints, and any other joints in concrete slabs or between slabs and foundation walls shall be sealed with a caulk or sealant. Gaps and joints shall be cleared of loose material and filled with a polyurethane caulk or other elastomeric sealant that complies with ASTM C 920 Class 25 or greater and is applied in accordance with the manufacturer's recommendations. Prior to sealing, backer rods shall be used to fill gaps that are greater than $\frac{1}{2}$ inch (12.7 mm) in depth.

~~B201.5.3~~ 809.2.5.3 Drains. Where floor, condensate and other drains discharge to the soil and not a sewer, such drains shall be provided with a water-seal trap or shall be water trapped or routed through nonperforated pipe to a point above grade.

~~B201.5.4~~ 809.2.5.4 Sumps. Sump pits open to soil or serving as the termination point for subslab or exterior drain tile loops shall be covered with a gasketed or otherwise sealed lid. Sumps used as a floor drain shall have a lid equipped with a trapped inlet.

~~B201.5.5~~ 809.2.5.5 Foundation walls. Hollow block masonry foundation walls shall be constructed with either a continuous course of solid masonry, one course of masonry grouted solid, or a solid concrete beam at or above finished ground surface to prevent passage of air from the interior of the wall into the living space. Where a brick veneer or other masonry ledge is installed, the course immediately below that ledge shall be sealed. Joints, cracks and other openings around all penetrations of both exterior and interior surfaces of masonry block or wood foundation walls below the ground surface shall be filled with a polyurethane caulk or other equivalent sealant that complies with ASTM C 920 Class 25 or greater and is applied in accordance with the manufacturer's recommendations. Penetrations of concrete walls shall be filled.

~~B201.5.6~~ 809.2.5.6 Dampproofing. The exterior surfaces of portions of concrete and masonry block walls below the ground surface shall be dampproofed.

~~B201.5.7~~ 809.2.5.7 Air-handling units. Air-handling units in crawl spaces shall be sealed to prevent air from being drawn into the unit.

Exception: Units with gasketed seams or units that are otherwise sealed by the manufacturer to prevent leakage.

~~B201.5.8~~ 809.2.5.8 Ducts. Ductwork for supply or return air shall not be located in crawl spaces or beneath a slab in areas with high or moderate radon potential. Where ductwork passes through or beneath a slab, it shall be of seamless material or sealed water tight. Joints in such ductwork shall be sealed water tight.

~~B201.5.9~~ 809.2.5.9 Crawl space floors. Openings around all penetrations through floors above crawl spaces shall be caulked or otherwise filled to prevent air leakage.

~~B201.5.10~~ 809.2.5.10 Crawl space access. Access doors and other openings or penetrations between basements and adjoining crawl spaces shall be closed, gasketed or otherwise filled to prevent air leakage.

~~B201.6~~ 809.2.6 Passive submembrane depressurization system. In buildings with crawl space foundations, the following components of a passive submembrane depressurization system shall be installed during construction.

Exception: Buildings in which an *approved* mechanical crawl space ventilation system or other equivalent system is installed.

~~B201.6.1~~ 809.2.6.1 Ventilation. Crawl spaces shall be provided with vents to the exterior of the building.

~~B201.6.2~~ 809.2.6.2 Soil-gas-retarder. The soil in crawl spaces shall be covered with a continuous layer of minimum 6-mil (0.15 mm) polyethylene soil-gas-retarder that conforms to ASTM E 1643. The ground cover shall be lapped a minimum of 12 inches (305 mm) at joints and shall extend to all foundation walls enclosing the crawl space area.

~~B201.6.3~~ 809.2.6.3 Vent pipe. A plumbing tee or other *approved* connection shall be inserted horizontally beneath the sheeting and connected to a 3- or 4-inch-diameter (76 mm or 102 mm) fitting with a vertical vent pipe installed through the sheeting. The vent pipe shall be extended up through the building floors, terminate at least 12 inches (305 mm) above the roof in a location at least 10 feet (3048 mm) away from any window or other opening into the conditioned spaces of the building that is less than 2 feet (610 mm) below the exhaust point, and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.

~~B201.7~~ 809.2.7 Passive subslab depressurization system. In basement or slab-on-grade buildings, the following components of a passive subslab depressurization system shall be installed during construction.

~~B201.7.1~~ 809.2.7.1 Vent pipe. A minimum 3-inch-diameter (76 mm) ABS, PVC or equivalent gas-tight pipe shall be embedded vertically into the subslab aggregate or other permeable material before the slab is cast. A "T" fitting or equivalent method shall be used to ensure that the pipe opening remains within the subslab permeable material. Alternatively, the 3-inch (76 mm) pipe shall be inserted directly into an interior perimeter drain tile loop or through a sealed sump cover where the sump is exposed to the subslab aggregate or connected to it through a drainage system.

The pipe shall be extended up through the building floors, terminate at least 12 inches (305 mm) above the surface of the roof in a location at least 10 feet (3048 mm) away from any window or other opening into the conditioned spaces of the building that is less than 2 feet (610 mm) below the exhaust point, and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.

~~B201.7.2~~ 809.2.7.2 Multiple vent pipes. In buildings where interior footings or other barriers separate the subslab aggregate or other gas-permeable material, each area shall be fitted with an

individual vent pipe. Vent pipes shall connect to a single vent that terminates above the roof or each individual vent pipe shall terminate separately above the roof.

B201.8-809.2.8 Vent pipe drainage. All components of the radon vent pipe system shall be installed to provide positive drainage to a suction pit beneath the slab, or to the ground beneath the slab or soil-gas-retarder. The slope of vent piping shall be not less than $\frac{1}{8}$ unit vertical in 12 units horizontal

B201.9-809.2.9 Vent pipe accessibility. Radon vent pipes shall be accessible for future fan installation through an attic or other area outside the habitable space.

Exception: The radon vent pipe need not be accessible in an attic space where an *approved* roof-top electrical supply is provided for future use.

B201.10-809.2.10 Vent pipe identification. All exposed and visible interior radon vent pipes shall be identified with at least one marking on each floor and in accessible attics. The marking shall read: "Radon Reduction System."

B201.11-809.2.11 Combination foundations. Combination basement/crawl space or slab-on-grade/crawl space foundations shall have separate radon vent pipes installed in each type of foundation area. Each radon vent pipe shall terminate above the roof or shall be connected to a single vent that terminates above the roof.

B201.12-809.2.12 Power source. To provide for future installation of an active submembrane or subslab depressurization system, an electrical circuit terminated in an *approved* box shall be installed during construction in the attic or other anticipated location of vent pipe fans. An electrical supply shall also be accessible in anticipated locations of system failure alarms.

Add new standard(s) as follows:

****Moving the following standards from Appendix B, Section B202 to Chapter 12**:**

ASTM

C 33/33M-08	Standard Specification for Concrete Aggregate
C 920-11	Standard Specification for Elastomeric Joint Sealants
E 1643-10	Standard Practice for Selection, Design, Installation, and Installation, and Inspection of Water Vapor Retarder Used in Contact with Earth of Granular Fill under Concrete Slabs

Reason: Radon is the number one cause of lung cancer among non-smokers. Radon is responsible for about 21,000 lung cancer deaths in the U.S. every year. In 2005, the Surgeon General issued a national health advisory on radon. Studies show definitive evidence of the association between residential radon exposure and lung cancer, leaving no doubt about the risks that radon in the home presents to Americans or its association with lung cancer. Although lung cancer can be treated, the survival rate is one of the lowest for those with cancer. After diagnosis, only 11-15% of lung cancer victims live beyond five years.

Adding radon-resistant new construction (RRNC) provisions to construction codes will ensure that new buildings do not expose occupants to dangerous levels of radon. Excluding radon from buildings prevents lung cancer. Builders can install features during new construction to create either a passive radon-resistance system or an active radon reduction system. An active system includes a fan, while a passive system could be upgraded with a fan if there's an elevated radon level. Radon-resistant new construction (RRNC) is much more cost effective than installing a radon reduction system after the building has been constructed. RRNC is consistent with energy-efficiency standards because tightening the building and sealing openings keep fuel costs down.

Similar language was a requirement in the IGCC's section 804 prior to the 2012 edition of the IGCC. At the 2011 hearings, the language was improved by several modifications but then demoted from the body of the code to Appendix B. With this proposal we seek to add radon resistant construction back as a requirement in Zones 1 and 2. This stretch code should not skip this fundamental green construction practice for ensuring indoor environmental quality.

This proposal is submitted on behalf of American Lung Association, Enterprise Community Partners, National Center for Healthy Housing, and the Environmental Protection Agency.

Cost Impact: Will increase the cost of construction

Analysis: The standards are not new. They are being moved from Appendix B to Chapter 12.

GG267-14 : 809 (NEW)-MALONE744

GG268-14

202 (New), 809 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

SECTION 809 **PUBLIC ACCESS STAIRWAYS**

809.1 General. Public access stairways shall be in accordance with Sections 809.1.1 through 809.1.4.

809.1.1 Where required. Not less than one public access stairway shall be provided. All levels within the building shall have access to not less than one public access stairway.

809.1.2 Doors in public access stairways. Doors serving a public access stairway shall be open on both sides, except where access to the level from the elevator is restricted to individuals by use of security devices that include, but are not limited to, card keys or codes. Doors serving a public access stairway that are normally locked from the egress side shall be openable by these same security devices.

809.1.3 Opening protection. Doors serving a public access stairway shall have fire-protection rated glazing of not less than 7 square feet.

Exception: Glazing in doors shall not be required where public access stairway door sidelights of not less than the same area are provided on one or both sides of a door serving a public access stairway.

809.1.4 Stairway identification. A public access stairway identification sign shall be provided on the occupied side of each door leading to a public access stairway. A public access stairway prompt sign shall be posted and maintained on each wall where an elevator call button is located.

Add new definitions as follows:

SECTION 202 **DEFINITIONS**

PUBLIC ACCESS STAIRWAY DOOR SIDELIGHTS. Fixed transparent panels, which form part of a fire door assembly and are immediately adjacent to the vertical edge of an opening in which a public access stairway door is located.

STAIRWAY, PUBLIC ACCESS. A continuous interior stairway that enables building occupants to utilize stairs to travel between the building entrance level and other levels.

Reason: Green buildings should encourage physical activity and reduce energy expended on elevators by providing accessible, inviting stairways. This proposal would require buildings to have such stairways, and to make them more inviting by putting transparent sections on or near the stairway doors. The proposal would also require buildings to have signs that clearly identify where the stairs are located, and remind people at elevators that stairs are nearby.

Bibliography: NYC Green Codes Task Force, Health and Toxicity Proposals [15](#), [16](#), [17](#), [18](#).

Cost Impact: Will not increase the cost of construction

GG268-14 : 809 (NEW)-SCHEIB1150

GG269-14

803.3, 809 (New)

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Chair, Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

SECTION 809

ENVIRONMENTAL TOBACCO SMOKE CONTROL

~~803.3-809.1 Environmental tobacco smoke control. General.~~ Smoking shall not be allowed inside of buildings. Any exterior designated smoking areas shall be located not less than 25 ft (7.5 m) away from building entrances, outdoor air intakes, and operable windows.

Reason: Section 803 is titled HVAC Systems. The environmental tobacco smoke control requirements, though they are currently located as a subsection of Section 803, are not related to HVAC system requirements. In previous public versions of the IgCC there were HVAC requirements related to environmental smoke control that required separate systems to isolate or separate and provide special features for HVAC systems in spaces where smoking was permitted. This is no longer the case. Simply prohibiting smoking in buildings and near building entrances, outdoor air intakes and operable windows, as the 2012 IgCC does, is not related to HVAC systems.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG269-14 : 809 (NEW)-THOMPSON352

GG270-14
901, 902, 903, 904

Proponent: Craig Conner, self, representing self (craig.conner@mac.com)

Delete without substitution:

901
GENERAL

902
APPROVED AGENCY

903
COMMISSIONING

904
BUILDING OPERATIONS AND MAINTENANCE

Reason: This chapter is covered better elsewhere. It is overly complex and being deleted by some who adopt the IgCC, such as Dallas.

Cost Impact: Will not increase the cost of construction

GG270-14 : CHAPTER 9-CONNER1203

GG271-14

202 (New), 901, 901.1, 901.2 (New), 902.1, 902.1.1, 902.1.2, 902.1.3, 903.1, 903.2 (New), 903.3 (New), 903.1.1, 903.4.1 (New), 903.1.2, 903.5.1 (New), 903.6 (New), 903.6.1 (New), 903.6.2 (New), 903.7 (New), 904.1, 904.2, 904.2.1 (New), 904.3

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, Chair, Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

CHAPTER 9 COMMISSIONING, INSPECTIONS, OPERATIONS AND MINTENANCE

SECTION 901 GENERAL

901.1 Scope. The provisions of this chapter ~~are intended to facilitate~~ contain the pre- and post-certificate of occupancy commissioning, inspection, operation and maintenance requirements for ~~of buildings and building sites~~, including ~~constructed in accordance with this code in a manner that is consistent with the intent of other provisions of this code, and to further that goal through the education of~~ information for building owners and maintenance personnel with regard to ~~related best operating and~~ maintenance requirements management practices.

901.2 Operations and maintenance. Buildings, structures and building sites and parts thereof shall be operated and maintained in accordance with the code applicable at the time of construction. The requirements of this chapter shall not provide the basis for removal or abrogation of fire protection or safety systems and devices in existing buildings or structures or on existing building sites.

SECTION 902 APPROVED AGENCY

902.1 Approved agency. An approved agency shall be qualified, demonstrate competence and provide all of the information necessary for the *code official* to determine that the agency meets the applicable requirements. The *code official* shall be permitted to be the approved agency. The registered design professional in responsible charge and the engineers of record involved in the design of the project shall be permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*.

902.1.1 Independence. An approved agency shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

902.1.2 Equipment. An approved agency shall have adequate equipment to perform the required commissioning. The equipment shall be periodically calibrated in accordance with manufacturer's specifications.

902.1.3 Personnel. An approved agency shall employ experienced personnel educated in conducting, supervising and evaluating tests, inspections and commissioning.

SECTION 903 COMMISSIONING

903.1 General. Where application is made for construction as described in this section, the construction documents shall indicate that the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after issuance of the certificate of occupancy as required by this code and Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic post-certificate of occupancy basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

~~The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the code official, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the code official. The approved agency shall provide written documentation to the code official demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.~~

Add new test as follows:

903.2 The commissioning process. The commissioning process shall consist of a sequence of activities, each with acceptance criteria as applicable, and shall conform to industry commissioning standards.

903.3 The commissioning plan. A commissioning plan shall be developed by a registered design professional or approved agency for all systems to be commissioned or inspected and shall include all of the following:

1. An overview of the commissioning process developed specifically for the project.
2. The roles and responsibilities for the commissioning and inspection providers throughout the project. The responsibilities shall delineate the duties of the commissioning providers, inspectors and other agencies.
3. Documentation of communication channels including the distribution of the commissioning plan, logs and reports during the design and construction process.
4. A detailed description of commissioning process activities, a schedule of activities, and the list of operations, systems and assemblies that will be commissioned or inspected. Performance criteria shall be included where not shown on the construction documents.
5. Project design documentation and submittal review procedures and reports.
6. Inspection checklists and testing forms, issues and resolution log, and commissioning and inspection process information.
7. The procedures to follow where commissioning evaluation does not meet the project requirements.
8. Required reports including format, approvals and distribution.

Revise as follows:

903.4 903.4.1 Pre-certificate of occupancy commissioning report requirement. The approved agency shall keep records of the pre-certificate of occupancy commissioning required by Table 903.1. The approved agency shall ~~furnish~~ issue logs and commissioning reports to the owner or the owner's authorized agent and the registered design professional in responsible charge and, upon request, to the *code official*. Reports shall indicate that work was or was not completed in conformance to *approved* construction documents. Discrepancies shall be brought to the ~~immediate~~ attention of the contractor for correction. Where discrepancies are not corrected, they shall be brought to the attention of the owner or the owner's authorized agent, code official and to the registered design professional in responsible charge and, where requested, to the *code official*, prior to the completion of that phase of the work. Prior to the issuance of a Certificate of Occupancy, a ~~final~~ pre-certificate of occupancy commissioning report

shall be submitted to and accepted by the building owner or the owner's authorized agent and, where requested, to the code official.

Add new text as follows:

903.4.1 Pre-certificate of occupancy commissioning report. The pre-certificate of occupancy commissioning report shall include the following:

1. Performance of commissioned operations, equipment, systems and assemblies.
2. Issue logs including itemization of deficiencies found during testing and commissioning required by this section that have not been corrected at the time of the preparation of this report.
3. Deferred tests that cannot be performed at the time of report preparation because of climatic or other conditions.
4. Climatic and other conditions required for performance of the deferred tests and a plan for their completion.

~~**903.4.2 903.5 Post-occupancy report requirement**~~ **Final commissioning report.** The commissioning activities included in the commissioning plan, including delayed testing, shall be accomplished and documented before project completion. Equipment, systems and assemblies repaired or replaced and adjustments to calibration and stings, shall be documented in final sequence of operation and in the systems manual. This documentation shall be provided to and accepted by the building owner or the owner's authorized agent and ~~Post-occupancy commissioning shall occur as specified in the applicable sections of this code.~~ A post-occupancy commissioning report shall be provided to the owner within 30 months after the Certificate of Occupancy is issued for the project and shall be made available to the code official upon request.

Add new text as follows:

903.5.1 Final commissioning report. A final commissioning report shall be submitted to the owner or the owners authorized agent prior to project completion and shall include the following:

1. A copy of the final commissioning plan, including functional and performance test procedures used during the commissioning process and measurable criteria for test acceptance.
2. A copy of the final owner's project requirements, basis of design, and design and submittal reviews as required by the commissioning plan.
3. The results of all evaluations, start-up data, functional and performance tests, and reports by suppliers, contractors, inspectors, and commissioning providers. Reports demonstrating compliance with the requirements of Table 903.1 shall be included.
4. Issue logs and disposition of all deficiencies found during testing, including details of corrective measures used or proposed.
5. A resolution plan approved by the owner or the owner's authorized agent identifying the issues that are unresolved or incomplete at the end of the project.

903.6 Systems manual. A complete systems manual shall be submitted to the owner or the owner's authorized agent prior to project completion. Materials in Item 1 to Section 903.6.2, except final record documents that are not yet available, and materials in Items 2 and 3 to Section 903.6.2, shall be provided. At least one copy of the systems manual shall be in the possession of the owner or the owner's authorized agent and at least one additional copy shall remain with the building throughout the life of the facility.

903.6.1 Updates. The systems manual shall be updated and maintained by the owner or the owner's authorized agent for the life of the building such that the building information is current.

903.6.2 Required information. The cover sheet for the systems manual shall indicate that at least one copy of the manual shall be in the possession of the owner or the owner's authorized agent and at least

one copy shall remain with the building throughout the life of the facility. The systems manual shall include the following:

1. Facility design and construction, including:
 - 1.1 Owners project requirements or current facility requirements and basis of design available for the project.
 - 1.2 Construction record documents in accordance with Section 903.7.1, including specifications and approved submittals.
2. Facility, systems and assemblies information including:
 - 2.1 Manufacturer's operation and maintenance data for installed equipment systems and assemblies.
 - 2.2 Warranties and certificate of occupancy.
 - 2.3 Contractor and supplier listing and contact information.
3. A facility operations guide, including an operating plan, building and equipment operating schedules, setpoints and ranges, sequences of operation, system and equipment limitations and emergency procedures.
4. Where training is provided, training plans, materials and records shall be provided.
5. A final commissioning report in accordance with Section 903.5.1.

903.7 Record documents. The cover sheet of the record documents for the project shall clearly indicate that at least one copy of the record documents shall be in the possession of the owner or the owner's authorized agent and at least one copy shall remain in the building. The building owner shall file a letter with the code official certifying the receipt of the record documents and building systems manual and commissioning documents at the completion of the project. The record documents shall include all of the following:

1. Copies of the approved construction documents, including plans and specifications.
2. Record plans, specifications, approved submittals and coordination drawings indicating the actual locations of equipment, systems and assemblies such as piping, ductwork, valves, controls, equipment, access panels, electrical equipment, plumbing equipment, lighting and other operating components and systems where they are visible or concealed, or are installed in locations other than those indicated on the approved construction documents.
3. For sites that have previously been a brownfield, or required environmental corrective action, remediation or restoration at the federal, state or local level, copies of engineering and institutional control information shall be provided.
4. Building operations and maintenance documents in accordance with Section 904.

Revise as follows:

**TABLE 903.1
COMMISSIONING AND INSPCETION PLAN REQUIREMENTS**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Pre-certificate of occupancy	Post-certificate of occupancy	
Chapter 4: Site Development and Land Use						
Natural resources and base line conditions of building site	X	None	Inspection and report	With permit submittal	None	401.2
Landscape irrigation systems	X	None	Field inspection and commissioning testing and report	Installation and testing	None	404.1, 405.1.1
Topsoil and vegetation protection	X	None	Field inspection and report	Installation of measures, prior to other	None	405.1.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Pre-certificate of occupancy	Post-certificate of occupancy	
measures; setbacks from protected areas				site disturbance		
Imported soils	X	None	Field inspection and report	With permit submittal; after all-fill operations complete	None	405.1.3
Soil restoration and reuse	X	None	Field inspection and report	During preparation and replacement of soils	None	405.1.4
Stormwater management system operation	None	X	Field inspection and report	During construction	24 months See maintenance plan	403.1
Erosion and sediment control	X	X	Field inspection and report	During construction activities	Periodic for 24 months See maintenance plan	405.1.1
Hardscape and shading provided by structures and vegetation	X	X	Field inspection and report	During construction and installation	24 months See maintenance plan	408.2
Vegetative roofs	X	X	Field inspection and report	During installation of protective membranes, base materials, soils and vegetation	24 months See maintenance plan	408.3.2
Site lighting	X	None	Commissioning testing and report	During installation and testing	None	409
Chapter 5: Material Resource Conservation and Efficiency						
Moisture control (Section 507.1)						
1. Foundation sub-soil drainage system.	X	None	Field inspection and report verification	Periodic inspection for entire sub-soil drainage system	None	507.1 and IBC Ch 18
2. Foundation waterproofing	X	None	Field inspection and report verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
3. Foundation dampproofing	X	None	Field inspection and report verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
4. Under slab water vapor protection	X	None	Field inspection and report verification	Periodic inspection for entire slab footprint	None	507.1, IBC Ch 19 and ASTM E 1643
5. Flashing at: exterior windows, doors, skylights, wall flashing and drainage systems	X	None	Field inspection and report verification	Periodic inspection for not less than 25 percent of all flashing locations.	None	507.1 and IBC Ch 14

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Pre- <u>certificate of occupancy</u>	Post- <u>certificate of occupancy</u>	
6. Exterior wall coverings	X	None	Field inspection and <u>report verification</u>	Periodic inspection for not less than 25 percent of exterior wall cladding systems.	None	507.1 and IBC Ch 14
7. Roof coverings, roof drainage, and flashings	X	None	Field inspection and <u>report verification</u>	Periodic inspection for not less than 25 percent of roof covering, roof drainage and flashings.	None	507.1 and IBC Ch 15
Chapter 6: Energy						
Energy consumption, monitoring, targeting and reporting						
a. Monitoring system	X	None	<u>Commissioning inspection, and verification and report</u>	During construction and prior to occupancy	None	603, 610.5
b. Calibration	X	X	<u>Commissioning testing and review and evaluation or test reports</u>	During <u>testing and commissioning</u>	Annually where <u>required in maintenance plans</u>	603, 610.5
<u>c. Dynamic window systems and automatic shading systems</u>			<u>Commissioning plan review and field inspection and report</u>	<u>Periodic inspection during construction</u>	None	
Mechanical systems completion – all buildings						
a. Air system balancing – provide the means for system balancing	X	None	<u>Commissioning inspection and report verification</u>	During construction and prior to occupancy	None	611.1.2.1 and through reference to IECC
b. Hydronic system balancing – provide means for system balancing	X	None	<u>Commissioning inspection and report verification</u>	During construction and prior to occupancy	None	611.1.2.2 and through reference to IECC
c. Mechanical system manuals – construction documents to require O&M systems manual	X	None	<u>Commissioning verification of construction documents</u>	Plan review	None	611.1.5.2
Mechanical systems – buildings over 5,000 square feet total building floor area						
a. Commissioning required and noted in plans and specifications	X	None	<u>Commissioning verification of construction documents</u>	Plan review	None	611.1
b. Documentation of required commissioning outcomes	X	None	<u>Commissioning verification with the building owner or owner's authorized agent</u>	<u>During construction and subsequent to completion of all commissioning activities</u>	None	611.1
c. Preparation and availability of a	X	None	<u>Commissioning verification with the</u>	Between plan review and	None	611.1.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Pre- <u>certificate of occupancy</u>	Post- <u>certificate of occupancy</u>	
commissioning plan			RDP or <u>commissioning agent</u>	commissioning initiation		
d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer, <u>TAB</u> /contractor or <u>and</u> <u>commissioning agent provider</u>	After installation of HVAC systems and prior to occupancy	<u>Where required in maintenance plans TBD</u>	611.1.2
e. Functional <u>and</u> performance testing of HVAC equipment	X	X	HVAC system installer/contractor <u>and</u> or <u>commissioning agent provider</u>	<u>During construction,</u> after installation of HVAC systems and prior to occupancy	<u>Where required in maintenance plans TBD</u>	611.1.3
f. Functional <u>and</u> performance testing of HVAC controls and control systems	X	X	HVAC system installer/contractor <u>and</u> or <u>commissioning agent provider</u>	After installation of HVAC systems and prior to occupancy	<u>Where required in maintenance plans TBD</u>	611.1.3.2
g. Preparation of preliminary commissioning report	None	X	HVAC system installer/contractor <u>and</u> or <u>commissioning agent provider</u>	<u>Prior to final inspection</u> None	<u>None</u> Subsequent to commissioning	611.1.4
h. Acceptance of HVAC systems and equipment/system verification report	None	X	Building owner or <u>owner's authorized agent</u>	<u>Letter verifying receipt of the commissioning report</u> None	<u>None</u> Letter verifying receipt of the commissioning report	611.1.4.1
i. Preparation and distribution of final HVAC system completion— Documentation that construction documents require drawings, manuals, balancing reports and commissioning report be provided to the owner or <u>owner's authorized agent</u> and that they have been provided	None	X	RDP, contractor <u>and</u> or-commissioning authority	<u>Before project completion</u> None	<u>None</u> 90-days after final certificate of occupancy	611.1.5
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	<u>Commissioning and functional testing</u>	Final inspection	<u>None</u> 18-24 months	604.4
Plug load controls	X	None	<u>Commissioning and functional testing</u>	Final inspection	None	608.6
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Pre- <u>certificate of occupancy</u>	Post- <u>certificate of occupancy</u>	
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10
Lighting controls						
a. Installation	X	None	Field inspection	Post-installation	None	608.11
b. Calibration	X	X	System installer/contractor and/or-commissioning provider agent	Post-installation prior to final inspection	18-24 months Where required in maintenance plans	611.3.3
Chapter 7: Water Resource Conservation, Quality and Efficiency						
Appliances	X	None	Inspection	—	None	702.6
Hot water distribution	X	None	Field testing and commissioning verification	Prior to final inspection	None	702.8
Cooling tower performance	—	X	Field testing and commissioning verification	Prior to final inspection	None	703.7.7
Metering	X	None	Field testing and commissioning verification	Prior to final inspection	None	705.1.1
Rainwater system water quality	None	X	Field testing and verification	None	None 707.15.1	707.15.1
Gray water system water quality	None	X	Field testing and verification	None	None 707.15.1	708.13.8
Soil percolation test	X	None	Field inspection and report	Prior to installation of gray water irrigation system	None	708.14.2
Chapter 8: Indoor Environmental Quality and Comfort						
Building construction, features, operations and maintenance facilitation						
Air-handling system access	X	X	Field inspection and commissioning verification	During construction and prior to occupancy	None 18–24 months	802.2
Air-handling system filters	X	X	Field inspection and commissioning verification	During construction and prior to occupancy	None 18–24 months	802.3
HVAC systems						
Temperature and humidity in occupied spaces	—	X	Field inspection and commissioning verification	Prior to project completion	None 18–24 months	803.2
Specific indoor air quality & pollutant control measures						
Listing, installation and venting of fireplaces and combustion appliances	X	—	Field inspection and verification	During construction and prior to occupancy	—	804.1
Sound transmission						
Mechanical and emergency generator equipment located outside buildings or located where	X	None	Field testing and verification	See Section 807.5.1	None	807.5.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Pre- <u>certificate of occupancy</u>	Post- <u>certificate of occupancy</u>	
exposed to exterior environment.						
HVAC background sound	×	None	Field testing and verification	See Section 807.5.2	None	807.5.2

For SI: 1 square foot = 0.0929 m²

SECTION 904 BUILDING OPERATIONS AND MAINTENANCE DOCUMENTATION

Delete without substitution:

904.1 General. Building operations and maintenance documents in accordance with Section 904.3 shall be submitted to the owner prior to the issuance of the Certificate of Occupancy. Record documents shall be in accordance with Section 904.2. The building owner shall file a letter with the *code official* certifying the receipt of record documents and building operations and maintenance documents. At least one copy of these materials shall be in the possession of the owner and at least one additional copy shall remain with the building throughout the life of the structure.

904.2 Record documents. The cover sheet of the record documents for the project shall clearly indicate that at least one copy of the materials shall be in the possession of the owner. Record documents shall include all of the following:

1. Copies of the *approved* construction documents, including plans and specifications.
2. As built plans and specifications indicating the actual locations of piping, ductwork, valves, controls, equipment, access panels, lighting and other similar components where they are concealed or are installed in locations other than those indicated on the *approved* construction documents.
3. For sites that have previously been a *brownfield*, or required environmental corrective action, remediation or restoration at the federal, state or local level, copies of engineering and institutional control information shall be provided.
4. A copy of the Certificate of Occupancy.

Revise as follows:

904.1 904.3 Building operations and maintenance documents. The building operations and maintenance documents shall consist of manufacturer's information, specifications and recommendations, programming procedures and data points, narratives, and other means of illustrating to the owner how the building, site, equipment and systems are intended to be installed, maintained and operated.

904.2 Required information. The following information shall be included in the operations and maintenance documents, materials, as applicable to the specific project:

1. Directions to the owner or occupant on the manual cover sheet indicating that at least one copy of the materials shall be in the possession of the owner or occupant.
- 2.1. Operations and maintenance manuals for equipment, products and systems installed under or related to the provisions of Chapter 4 including, but not limited to, the following, as applicable:
 - 1.1 2.1 Vegetative shading, vegetative roofs and Natural resource protections and setbacks.
 - 2.2 Water conserving landscape and irrigation systems.
 - 2.3 Stormwater management systems.
 - 2.4 Permanent erosion control measures.
 - 1.2 2.5 Landscape or tree management plans.

- ~~23.~~ Operations and maintenance documents for materials, products, assemblies and systems installed under or related to the provisions of this code for material resource conservation in accordance with Chapter 5 including, but not limited to, the following, as applicable:
 - ~~3.12.1~~ Care and maintenance instructions and recommended replacement schedule for flooring, including, but not limited to, carpeting, walk-off mats and tile.
 - ~~3.22.2~~ Care and maintenance instructions for natural materials including, but not limited to, wood, bio-based materials and stone.
 - ~~3.32.3~~ Available manufacturer's instructions on maintenance for:
 - ~~3.3.1 2.3.1~~ Exterior wall finishes.
 - ~~3.3.2~~ Roof coverings.
 - ~~3.3.3 3.2~~ Exterior doors, windows and skylights.
 - ~~3.4 2.4~~ Information and recommended schedule for required routine maintenance measures, including, but not limited to, painting and refinishing.
- 43. Operations and maintenance documents for equipment, products and systems installed under or related to the provisions of this code for energy conservation in accordance with Chapter 6 including, but not limited to, the following:
 - 4.13.1 Heating, ventilating and air-conditioning systems including:
 - 4.1.13.1.1 Recommended equipment maintenance schedule and procedures.
 - 4.1.23.1.2 Air filters and fluid filters, including recommended replacement schedule and materials.
 - 4.1.3 Time clocks, including settings determined during commissioning.
 - 4.1.4 Programmable controls and thermostats, including settings determined during commissioning.
 - 4.23.2 Domestic hot water systems including performance criteria and controls.
 - 4.33.3 *Building thermal envelope* systems including:
 - 4.3.13.3.1 Glazing systems inspection schedule.
 - 4.3.23.3.2 Performance criteria for replacements and repairs.
 - 4.3.33.3.3 Information and recommended schedule on required routine maintenance measures, including but not limited to, sealants, mortar joints and screens.
 - 4.13.1 Electrical and lighting systems including:
 - 4.1.1 Technical specifications and operating instructions for installed lighting equipment.
 - 4.1.23.1.1 Luminaire maintenance and cleaning plan.
 - 4.1.33.1.2 Lamp schedule, recommended re-lamping plan, and lamp disposal information.
 - 4.1.4 Programmable and automatic controls documentation, including settings determined during commissioning.
 - 4.1.5 Occupant sensor and daylight sensors documentation, including settings determined during commissioning.
 - ~~4.2~~ Automatic demand reduction systems.
- ~~5.4.~~ Operations and maintenance documents for equipment, products and systems installed under or related to the provisions of this code for water conservation in accordance with Chapter 7, including, but not limited to the following:
 - ~~5.1~~ Domestic fixtures.
 - ~~5.2~~ Water-regulating devices including faucets and valves, and water heating systems maintenance procedures.
 - ~~5.3~~ Irrigation and rainwater and gray water catchment.
- ~~6.5.~~ Operations and maintenance documents for equipment products and systems under or related to the provisions of this code for indoor environmental quality in accordance with Chapter 8, including, but not limited to, the following:
 - ~~6.15.1~~ Humidification/dehumidification systems maintenance.
 - ~~6.25.2~~ Green cleaning products, procedures and techniques.
 - ~~6.3~~ Recommended window cleaning schedule.
 - ~~6.4~~ Ventilation controls.
 - ~~6.5~~ Floor finishes.
 - ~~6.6~~ Fireplaces and combustion appliances.

SECTION 202 DEFINITIONS

BASIS OF DESIGN. A document that records the concepts, calculations, decisions and product selections used to meet the owner's project requirements and to satisfy applicable regulatory requirements, standards and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process. Also see the definition of owner's project requirements.

OWNER'S PROJECT REQUIREMENTS. A written document that details the functional requirements of a project and the expectations of how it will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria and supporting information.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Chapter 9 is revised for clarification of commissioning, inspection, and operations processes. The report detail items in chapter 6 and chapter 9 are combined to provide clarity and completeness. With these changes all the commissioning report requirements are in one chapter. The revisions particularly to Table 903.1 also separate the pre-certificate of occupancy requirements and the operation phase testing and reporting as is currently performed in the industry.

The changes to Section 904 remove the redundancies with Section 903 and Table 903.1.

The proposed new definitions for "basis of design" and "owner's project requirements" are derived from ASHRAE 202.

A separate companion proposal related to the commissioning requirements of Chapter 6 has also been submitted by the SEHPCAC.

Cost Impact: Will increase the cost of construction.

GG271-14 : CHAPTER 9-THOMPSON1094

GG 272-14

901.1, 903

Proponent: Maureen Traxler, City of Seattle Dept of Planning & Development, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

901.1 Scope.

The provisions of this chapter are intended to facilitate the pre- and post-occupancy special inspection, commissioning, operation and maintenance of buildings constructed in accordance with this code in a manner that is consistent with the intent of other provisions of this code, and to further that goal through the education of building owners and maintenance personnel with regard to related best operating and management practices.

SECTION 903 **SPECIAL INSPECTION AND COMMISSIONING**

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform special inspection and commissioning during construction and after occupancy as required by Tables 903.1 and 903.2. Where a Table 903-4 specifies that special inspection or commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and approved by the code *official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the special inspection or commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

TABLE 903.1
COMMISSIONING PLAN

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 4: Site Development and Land Use						
Natural resources and base-line conditions of building site	X	None	Report	With permit submittal	None	401.2
Landscape irrigation systems	X	None	Field inspection	Installation	None	404.1, 405.1.1
Topsoil and vegetation protection measures; setbacks from protected areas	X	None	Field inspection and report	Installation of measures, prior to other site disturbance	None	405.1.1
Imported soils	X	None	Field inspection and report	With permit submittal; after all-fill operations complete	None	405.1.3
Soil restoration and reuse	X	None	Field inspection and report	Preparation and replacement of	None	405.1.4

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
				soils		
Stormwater management system operation	None	X	Field inspection	—	24 months	403.1
Erosion and sediment control	X	X	Field inspection	During construction activities	Periodic for 24 months	405.1.1
Hardscape and shading provided by structures and vegetation	X	X	Field inspection and report	During construction and installation	24 months	408.2
Vegetative roofs	X	X	Field inspection and report	Installation of protective membranes, base materials, soils and vegetation	24 months	408.3.2
Site lighting	X	None	Testing and report	Installation	None	409
Chapter 5: Material Resource Conservation and Efficiency						
Moisture control (Section 507.1)						
1. Foundation sub-soil drainage system.	X	None	Field inspection and verification	Periodic inspection for entire sub-soil drainage system	None	507.1 and IBC-Ch 18
2. Foundation waterproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC-Ch 18
3. Foundation dampproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC-Ch 18
4. Under slab water vapor protection	X	None	Field inspection and verification	Periodic inspection for entire slab footprint	None	507.1, IBC-Ch 19 and ASTM E 1643
5. Flashing at exterior windows, doors, skylights, wall flashing and drainage systems	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of all flashing locations.	None	507.1 and IBC-Ch 14
6. Exterior wall coverings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of exterior wall cladding systems.	None	507.1 and IBC-Ch 14
7. Roof coverings, roof drainage, and flashings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of roof covering, roof drainage, and flashings.	None	507.1 and IBC-Ch 15
Chapter 6: Energy						
Energy consumption, monitoring, targeting and reporting						
a. Monitoring system	X	None	Inspection and verification	During construction and prior to occupancy	None	603, 610.5
b. Calibration	X	X	Testing and review	During	Annually	603, 610.5

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
			and evaluation or test reports	commissioning		
Mechanical systems completion – all buildings						
a. Air system balancing – provide the means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.1 and through reference to IECC
b. Hydronic system balancing – provide means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.2 and through reference to IECC
c. Mechanical system manuals – construction documents to require O&M manual	X	None	Verification of construction documents	Plan review	None	611.1.5.2
Mechanical systems – buildings over 5,000 square feet total building floor area						
a. Commissioning required and noted in plans and specifications	X	None	Verification of construction documents	Plan review	None	611.1
b. Documentation of required commissioning outcomes	X	None	Verification with the building owner	Subsequent to completion of all commissioning activities	None	611.1
c. Preparation and availability of a commissioning plan	X	None	Verification with the RDP or commissioning agent	Between plan review and commissioning initiation	None	611.1.1
d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.2
e. Functional performance testing of HVAC equipment	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3
f. Functional performance testing of HVAC controls and control systems	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3.2
g. Preparation of preliminary commissioning report	None	X	HVAC system installer/contractor or commissioning agent	None	Subsequent to commissioning	611.1.4
h. Acceptance of HVAC systems and equipment/system verification report	None	X	Building owner	None	Letter verifying receipt of the commissioning report	611.1.4.1
i. Preparation and distribution of final HVAC system completion— Documentation that construction documents require drawings, manuals, balancing reports and commissioning	None	X	RDP, contractor or commissioning authority	None	90 days after final certificate of occupancy	611.1.5

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
report be provided to the owner and that they have been provided						
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4
Plug load controls	X	None	Functional testing	Final inspection	None	608.6
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10
Lighting controls						
a. Installation	X	None	Field inspection	Post-installation	None	608.11
b. Calibration	X	X	System installer/contractor or commissioning agent	Post-installation	18-24 months	611.3.3
Chapter 7: Water Resource Conservation, Quality and Efficiency						
Appliances	X	None	—	—	—	702.6
Hot water distribution	X	None	—	—	—	702.8
Cooling tower performance	—	X	—	—	—	703.7.7
Metering	X	None	—	—	—	705.1.1
Rainwater system water quality	None	X	Field testing and verification	None	707.15.1	707.15.1
Gray water system water quality	None	X	Field testing and verification	None	708.13.8	708.13.8
Soil percolation test	X	None	Field inspection and report	Prior to installation of gray water irrigation system	None	708.14.2
Chapter 8: Indoor Environmental Quality and Comfort						
Building construction, features, operations and maintenance facilitation						
Air-handling system access	X	X	Field inspection and verification	During construction and prior to occupancy	18 - 24 months	802.2
Air-handling system filters	X	X	Field inspection and verification	During construction and prior to occupancy	18 - 24 months	802.3
HVAC systems						
Temperature and humidity in occupied spaces	—	X	Field inspection and verification	—	18 - 24 months	803.2
Specific indoor air quality & pollutant control measures						
Listing, installation and venting of fireplaces and	X	—	Field inspection and verification	During construction and prior to	—	804.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
combustion-appliances				occupancy		
Sound transmission						
Mechanical and emergency generator equipment located outside buildings or located where exposed to exterior environment.	X	None	Field testing and verification	See Section 807.5.1	None	807.5.1
HVAC background sound	X	None	Field testing and verification	See Section 807.5.2	None	807.5.2

For SI: 1 square foot = 0.0929 m².

Add new table as follows:

**TABLE 903.2
REQUIRED SPECIAL INSPECTIONS**

<u>CONSTRUCTION OR SYSTEM REQUIRING SPECIAL INSPECTION</u>	<u>METHOD AND FREQUENCY</u>	<u>SECTION</u>
<u>1. Landscape irrigation systems</u>	<u>Periodic inspection during Installation</u>	<u>404.1, 405.1.1</u>
<u>2. Foundation sub-soil drainage system.</u>	<u>Periodic inspection for entire sub-soil drainage system</u>	<u>507.1 and IBC Ch 18</u>
<u>3. Foundation waterproofing</u>	<u>Periodic inspection for the entire foundation</u>	<u>507.1 and IBC Ch 18</u>
<u>4. Foundation dampproofing</u>	<u>Periodic inspection for the entire foundation</u>	<u>507.1 and IBC Ch 18</u>
<u>5. Under slab water vapor protection</u>	<u>Periodic inspection for entire slab footprint</u>	<u>507.1, IBC Ch 19 and ASTM E 1643</u>
<u>6. Flashing at: exterior windows, doors, skylights, wall flashing and drainage systems</u>	<u>Periodic inspection for not less than 25 percent of all flashing locations.</u>	<u>507.1 and IBC Ch 14</u>
<u>7. Exterior wall coverings</u>	<u>Periodic inspection for not less than 25 percent of exterior wall cladding systems.</u>	<u>507.1 and IBC Ch 14</u>

<u>CONSTRUCTION OR SYSTEM REQUIRING SPECIAL INSPECTION</u>	<u>METHOD AND FREQUENCY</u>	<u>SECTION</u>
8. <u>Roof coverings, roof drainage, and flashings</u>	<u>Periodic inspection for not less than 25 percent of roof covering, roof drainage and flashings.</u>	<u>507.1 and IBC Ch 15</u>

Revise as follows:

**903.1.1
Preoccupancy report requirement.**

The approved agency shall keep records of the special inspection and commissioning required by Tables 903.1 and 903.2. The approved agency shall furnish ~~commissioning~~ reports to the owner and the registered design professional in responsible charge and, upon request, to the code official. Reports shall indicate that work was or was not completed in conformance to *approved* construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. Where discrepancies are not corrected, they shall be brought to the attention of the owner, *code official and* to the registered design professional in responsible charge prior to the completion of that phase of the work. Prior to the issuance of a Certificate of Occupancy, a final ~~commissioning~~ report shall be submitted to and accepted by the code official.

Reason: This proposal clarifies Table 903 by removing items that are not part of commissioning. Table 903 contains three separate types of items—some are part of a commissioning plan, some are special inspections not related to building commissioning, and some fall within the scope of the code official's responsibility. In this proposal, some of those items are moved to a new table for special inspections, and some are simply deleted.

The items that remain either test the actual performance of equipment or systems, or are actions taken after the Certificate of Occupancy has been issued. For example, inspection of storm water management and erosion control systems (Chapter 4 in the table) continues for 24 months after occupancy. In most cases, the code official's authority ceases after a building is approved for occupancy, so those items are appropriately done by another agency. Testing and verification of rainwater system water quality (Chapter 7) is left in Table 903.1 because it is outside the expertise of code officials. Similarly, testing and verifying sound transmission (Chapter 8) is also outside the code official's expertise. The Chapter 6 portion of the table remains in the table because it lists items that are part of commissioning done for compliance with Section 611.

The new Table 903.2 includes inspection items that are beyond the scope of usual building inspections. The IBC defines special inspection, in part, as "requiring the expertise of an approved special inspector." Inspection of landscape irrigation systems fits that description. The other items in Table 903.2 are inspections required by Section 507 which adds inspection requirements to existing IBC provisions. These inspections are performed during construction of the building elements in order to add assurance that the building envelope will be dry and healthy. Even though the construction requirements of Section 507 are IBC provisions, the extra inspections should be done by an approved agency to provide the extra attention intended by Section 507.

The deleted items are within the scope of tasks routinely done by code officials. For example, the first item in the table is submittal of a report on baseline site conditions. The report is neither commissioning nor special inspection; it's simply one of the construction documents for the project. It isn't necessary to require an approved agency to check for the report. Similarly, inspecting soil isn't commissioning and it doesn't require a special inspector. In the chapter 7 section of Table 903.1, code officials routinely check the ratings of equipment; water quality testing will be done by a specialized organization that will provide a report to the owner and the code official.

Cost Impact: Will not increase the cost of construction

GG 272-14 : 901.1-TRAXLER935

GG273-14

902, 903.1, 903.1.1 (New), 903.1.1.1 (New), 903.1.1.2 (New), 903.1.1.3 (New), 903.1.1.4 (New), 903.1.1, 903.1.2

Proponent: Maureen Traxler, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Delete without substitution:

902 APPROVED AGENCY

~~**902.1 Approved agency.** An approved agency shall provide all of the information necessary for the code official to determine that the agency meets the applicable requirements. The code official shall be permitted to be the approved agency.~~

Revise as follows:

903.1 General. ~~Where application is made for construction as described in this section, the~~The registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. The code official is permitted to be the approved agency. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal construction documents that shall be reviewed and approved by the code official.

Add new text as follows:

903.1.1 Approved agencies. Approved agencies shall comply with Sections 903.1.1.1 through 903.1.1.3.

Revise as follows:

903.1.1.1 Qualification of approved agencies. The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided they ~~these~~ personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

903.1.1.2 902.1.1 Independence. ~~An approved agency~~ Approved agencies shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

903.1.1.3 902.1.2 Equipment. ~~An approved agency~~ Approved agencies shall have adequate equipment to perform the required commissioning. The equipment shall be periodically calibrated.

903.1.1.4 902.1.3 Personnel. ~~An approved agency~~ Approved agencies shall employ experienced personnel educated in conducting, supervising and evaluating tests and commissioning.

903.1.1 903.2 Preoccupancy report requirement. The approved agency shall keep records of the commissioning required by Table 903.1. The approved agency shall furnish commissioning reports to the owner and the registered design professional in responsible charge and, upon request, to the *code official*. Reports shall indicate that work was or was not completed in conformance to *approved* construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. Where discrepancies are not corrected, they shall be brought to the attention of the owner, *code official* and to the registered design professional in responsible charge prior to the completion of that phase of the work. Prior to the issuance of a Certificate of Occupancy, a final commissioning report shall be submitted to and accepted by the *code official*.

903.1.2 903.3 Post-occupancy report requirement. Post-occupancy commissioning shall occur as specified in the applicable sections of this code. A post-occupancy commissioning report shall be provided to the owner within 30 months after the Certificate of Occupancy is issued for the project and shall be made available to the *code official* upon request.

Reason: This proposal combines Sections 902 and 903, eliminating redundancy and putting all the provisions for approved agencies in one section.

Cost Impact: Will not increase the cost of construction

GG273-14 : 902-TRAXLER923

GG274-14
507.1, 903.1

Proponent: Laverne Dalglish, representing BEMMI (ldalglish@airbarrier.org)

Revise as follows:

507.1 Moisture control preventative measures. Moisture preventative measures shall be inspected in accordance with Sections 902 and 903 for the categories listed in Items 1 through 7. Inspections shall be executed in a method and at a frequency as listed in Table 903.1.

1. Foundation sub-soil drainage system.
2. Foundation waterproofing.
3. Foundation dampproofing.
4. Under slab water vapor protection.
5. Flashings: Windows, exterior doors, skylights, wall flashing and drainage systems.
6. Exterior wall coverings and drainage systems.
7. Roof coverings, roof drainage, and flashings.

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

TABLE 903.1
COMMISSIONING PLAN

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 5: Material Resource Conservation and Efficiency						
Moisture control (Section 507.1)						
1. Foundation sub-soil drainage system.	X	None	Field inspection and verification	Periodic inspection for entire sub-soil drainage system	None	507.1 and IBC Ch 18
2. Foundation waterproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18

3. Foundation dampproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
4. Under slab water vapor protection	X	None	Field inspection and verification	Periodic inspection for entire slab footprint	None	507.1, IBC Ch 19 and ASTM E 1643
5. Flashing at: exterior windows, doors, skylights, wall flashing and drainage systems	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of all flashing locations.	None	507.1 and IBC Ch 14
6. Exterior wall coverings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of exterior wall cladding	None	507.1 and IBC Ch 14
6a Exterior wall drainage system	<u>X</u>	<u>None</u>	<u>Field inspection and verification</u>	<u>Periodic inspection of wall drainage system</u>	<u>None</u>	<u>507.1 and IBC Ch 14</u>
7. Roof coverings, roof drainage, and flashings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of roof covering, roof drainage and flashings	None	507.1 and IBC Ch 15

For SI: 1 square foot = 0.0929 m².

(Portions of table not shown remain unchanged.)

Reason: The inspection of the drainage and ventilation system will result in a wall that will drain water efficiently and then dry. This will improve the performance of the wall assemblies and will add to the building's longevity.

Cost Impact: Will increase the cost of construction. There will be an increased cost of inspection as this inspection needs to be done at a different time than the cladding system.

GG274-14 : 903.1 #1 -DALGLEISH1126

GG275-14
903.1, Table 903.1

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Laverne Dalgleish, representing Air Barrier Association of America (ldalgleish@airbarrier.org)

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
 COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 6: Energy						
Energy consumption, monitoring, targeting and reporting						
a. Monitoring system	X	None	Inspection and verification	During construction and prior to occupancy	None	603, 610.5
b. Calibration	X	X	Testing and review and evaluation or test reports	During commissioning	Annually	603, 610.5
Mechanical systems completion – all buildings						
a. Air system balancing – provide the means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.1 and through reference to IECC
b. Hydronic system balancing – provide means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.2 and through reference to IECC

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
c. Mechanical system manuals – construction documents to require O&M manual	X	None	Verification of construction documents	Plan review	None	611.1.5.2
Mechanical systems – buildings over 5,000 square feet total building floor area						
a. Commissioning required and noted in plans and specifications	X	None	Verification of construction documents	Plan review	None	611.1
b. Documentation of required commissioning outcomes	X	None	Verification with the building owner	Subsequent to completion of all commissioning activities	None	611.1
c. Preparation and availability of a commissioning plan	X	None	Verification with the RDP or commissioning agent	Between plan review and commissioning initiation	None	611.1.1
d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer/contract or or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.2
e. Functional performance testing of HVAC equipment	X	X	HVAC system installer/contract or or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3
f. Functional performance testing of HVAC controls and control systems	X	X	HVAC system installer/contract or or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3.2
g. Preparation of preliminary commissioning report	None	X	HVAC system installer/contract or or commissioning agent	None	Subsequent to commissioning	611.1.4
h. Acceptance of HVAC systems and equipment/system verification report	None	X	Building owner	None	Letter verifying receipt of the commissioning report	611.1.4.1
i. Preparation and distribution of final HVAC system completion— Documentation that construction documents require drawings, manuals, balancing reports and commissioning report	None	X	RDP, contractor or commissioning authority	None	90 days after final certificate of occupancy	611.1.5

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
be provided to the owner and that they have been provided						
<u>Building Envelope Air Leakage</u>						
<u>Air barrier system</u>	<u>X</u>	<u>None</u>	<u>Whole building test</u>	<u>After completion of the air barrier system</u>	<u>None</u>	<u>605.1.2</u>
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4
Plug load controls	X	None	Functional testing	Final inspection	None	608.6
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10
Lighting controls						
a. Installation	X	None	Field inspection	Post-installation	None	608.11
b. Calibration	X	X	System installer/contract or or commissioning agent	Post-installation	18-24 months	611.3.3

(Portions of table not shown remain unchanged)

Reason: The commissioning process needs to include the commissioning of the air barrier system. The requirement for whole building testing is already included.

Cost Impact: Will not increase the cost of construction. Whole building testing and building commissioning is already included.

GG275-14: 903.1 #2-DALGLEISH1145

GG276-14

903.1, 903.1.2, Appendix E (New), E101.1 (New)

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) (SEHPCAC@iccsafe.org)

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 4: Site Development and Land Use						
Natural resources and base line conditions of building site	X	None	Report	With permit submittal	None	401.2
Landscape irrigation systems	X	None	Field inspection	Installation	None	404.1, 405.1.1
Topsoil and vegetation protection measures; setbacks from protected areas	X	None	Field inspection and report	Installation of measures, prior to other site disturbance	None	405.1.1
Imported soils	X	None	Field inspection and report	With permit submittal; after all-fill operations complete	None	405.1.3
Soil restoration and reuse	X	None	Field inspection and report	Preparation and replacement of soils	None	405.1.4
Stormwater management system operation	None	X	Field inspection	—	24 months	403.1
Erosion and sediment control	X	X	Field inspection	During construction activities	Periodic for 24 months	405.1.1
Hardscape and shading provided by structures and vegetation	X	X	Field inspection and report	During construction and installation	24 months	408.2

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Vegetative roofs	X	X	Field inspection and report	Installation of protective membranes, base materials, soils and vegetation	24 months	408.3.2
Site lighting	X	None	Testing and report	Installation	None	409
Chapter 5: Material Resource Conservation and Efficiency						
Moisture control (Section 507.1)						
1. Foundation sub-soil drainage system.	X	None	Field inspection and verification	Periodic inspection for entire sub-soil drainage system	None	507.1 and IBC Ch 18
2. Foundation waterproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
3. Foundation dampproofing	X	None	Field inspection and verification	Periodic inspection for the entire foundation	None	507.1 and IBC Ch 18
4. Under slab water vapor protection	X	None	Field inspection and verification	Periodic inspection for entire slab footprint	None	507.1, IBC Ch 19 and ASTM E 1643
5. Flashing at: exterior windows, doors, skylights, wall flashing and drainage systems	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of all flashing locations.	None	507.1 and IBC Ch 14
6. Exterior wall coverings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of exterior wall cladding systems.	None	507.1 and IBC Ch 14
7. Roof coverings, roof drainage, and flashings	X	None	Field inspection and verification	Periodic inspection for not less than 25 percent of roof covering, roof drainage and flashings.	None	507.1 and IBC Ch 15
Chapter 6: Energy						
Energy consumption, monitoring, targeting and reporting						
a. Monitoring system	X	None	Inspection and verification	During construction and prior to occupancy	None	603, 610.5
b. Calibration	X	X	Testing and review and evaluation or test reports	During commissioning	Annually	603, 610.5
Mechanical systems completion – all buildings						
a. Air system balancing – provide the means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.1 and through reference to IECC
b. Hydronic system balancing – provide means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.2 and through reference to IECC
c. Mechanical	X	None	Verification of	Plan review	None	611.1.5.2

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
system manuals – construction documents to require O&M manual			construction documents			
Mechanical systems – buildings over 5,000 square feet total building floor area						
a. Commissioning required and noted in plans and specifications	X	None	Verification of construction documents	Plan review	None	611.1
b. Documentation of required commissioning outcomes	X	None	Verification with the building owner	Subsequent to completion of all commissioning activities	None	611.1
c. Preparation and availability of a commissioning plan	X	None	Verification with the RDP or commissioning agent	Between plan review and commissioning initiation	None	611.1.1
d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.2
e. Functional performance testing of HVAC equipment	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3
f. Functional performance testing of HVAC controls and control systems	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3.2
g. Preparation of preliminary commissioning report	None	X	HVAC system installer/contractor or commissioning agent	None	Subsequent to commissioning	611.1.4
h. Acceptance of HVAC systems and equipment/system verification report	None	X	Building owner	None	Letter verifying receipt of the commissioning report	611.1.4.1
i. Preparation and distribution of final HVAC system completion – Documentation that construction documents require drawings, manuals, balancing reports and commissioning report be provided to the owner and that they have been provided	None	X	RDP, contractor or commissioning authority	None	90 days after final certificate of occupancy	611.1.5
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4
Plug load controls	X	None	Functional testing	Final inspection	None	608.6
Connection of	—	X	Field inspection	None	18-24 months	608.6

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PRE OCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
appliances to switched receptacles						
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10
Lighting controls						
a. Installation	X	None	Field inspection	Post-installation	None	608.11
b. Calibration	X	X	System installer/contractor or commissioning agent	Post-installation	18-24 months	611.3.3
Chapter 7: Water Resource Conservation, Quality and Efficiency						
Appliances	X	None	—	—	—	702.6
Hot water distribution	X	None	—	—	—	702.8
Cooling tower performance	—	X	—	—	—	703.7.7
Metering	X	None	—	—	—	705.1.1
Rainwater system water quality	None	X	Field testing and verification	None	707.15.1	707.15.1
Gray water system water quality	None	X	Field testing and verification	None	708.13.8	708.13.8
Soil percolation test	X	None	Field inspection and report	Prior to installation of gray water irrigation system	None	708.14.2
Chapter 8: Indoor Environmental Quality and Comfort						
Building construction, features, operations and maintenance facilitation						
Air-handling system access	X	X	Field inspection and verification	During construction and prior to occupancy	18-24 months	802.2
Air-handling system filters	X	X	Field inspection and verification	During construction and prior to occupancy	18-24 months	802.3
HVAC systems						
Temperature and humidity in occupied spaces	—	X	Field inspection and verification	—	18-24 months	803.2
Specific indoor air quality & pollutant control measures						
Listing, installation and venting of fireplaces and combustion appliances	X	—	Field inspection and verification	During construction and prior to occupancy	—	804.1
Sound transmission						
Mechanical and emergency generator equipment located outside buildings or located where exposed to exterior environment.	X	None	Field testing and verification	See Section 807.5.1	None	807.5.1
HVAC background sound	X	None	Field testing and verification	See Section 807.5.2	None	807.5.2

For SI: 1 square foot = 0.0929 m²

Delete and substitute as follows:

903.1.2 Post-occupancy report requirement. ~~Post-occupancy commissioning shall occur as specified in the applicable sections of this code. A post-occupancy commissioning report shall be provided to the owner within 30 months after the Certificate of Occupancy is issued for the project and shall be made available to the code official upon request.~~

**APPENDIX E
POST-OCCUPANCY COMMISSIONING REPORTING**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

E101.1 Post-occupancy report requirement. Post-occupancy commissioning reporting shall be provided in accordance with Table E101.1 The post-occupancy commissioning reports shall be provided to the owner and shall be made available to the code official upon request. Any actions taken to address deficiencies cited in the post-occupancy commissioning reporting shall be solely at the discretion of the owner or the owner's authorized agent, except where other more restrictive requirements exist in the jurisdiction.

**TABLE E101.1 (1)
POST-OCCUPANCY COMMISSIONING REPORTING**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	METHOD	OCCURRENCE	GOVERNING SECTION
Chapter 4: Site Development and Land Use			
<u>Stormwater management system operation</u>	<u>Field inspection</u>	<u>24 months</u>	<u>403.1</u>
<u>Erosion and sediment control</u>	<u>Field inspection</u>	<u>Periodic for 24 months</u>	<u>405.1.1</u>
<u>Hardscape and shading provided by structures and vegetation</u>	<u>Field inspection and report</u>	<u>24 months</u>	<u>408.2</u>
<u>Vegetative roofs</u>	<u>Field inspection and report</u>	<u>24 months</u>	<u>408.3.2</u>
Chapter 6: Energy			
<u>Energy consumption, monitoring, targeting and reporting</u>			
<u>Calibration</u>	<u>Testing and review and evaluation or test reports</u>	<u>Annually</u>	<u>603, 610.5</u>
<u>Mechanical systems – buildings over 5,000 square feet total building floor area</u>			
<u>a. Balance HVAC systems (both air and hydronic)</u>	<u>HVAC system installer/contractor or commissioning agent</u>	<u>TBD</u>	<u>611.1.2</u>
<u>b. Functional performance testing of HVAC equipment</u>	<u>HVAC system installer/contractor or commissioning agent</u>	<u>TBD</u>	<u>611.1.3</u>
<u>c. Functional performance testing of HVAC controls and control systems</u>	<u>HVAC system installer/contractor or commissioning agent</u>	<u>TBD</u>	<u>611.1.3.2</u>
<u>d. Preparation of preliminary commissioning report</u>	<u>HVAC system installer/contractor or commissioning agent</u>	<u>Subsequent to commissioning</u>	<u>611.1.4</u>
<u>e. Acceptance of HVAC systems and equipment/system verification report</u>	<u>Building owner</u>	<u>Letter verifying receipt of the</u>	<u>611.1.4.1</u>

		<u>commissioning report</u>	
<u>f. Preparation and distribution of final HVAC system completion— Documentation that construction documents require drawings, manuals, balancing reports and commissioning report be provided to the owner and that they have been provided</u>	<u>RDP, contractor or commissioning authority</u>	<u>90 days after final certificate of occupancy</u>	<u>611.1.5</u>
Chapter 6: Lighting			
<u>Auto demand reduction control system functionality</u>	<u>Functional testing</u>	<u>18-24 months</u>	<u>604.4</u>
<u>Connection of appliances to switched receptacles</u>	<u>Field inspection</u>	<u>18-24 months</u>	<u>608.6</u>
<u>Verification of lamp Calibration</u>	<u>Field inspection</u>	<u>18-24 months</u>	<u>608.10</u>
	<u>System installer/contractor or commissioning agent</u>	<u>18-24 months</u>	<u>611.3.3</u>
Chapter 7: Water Resource Conservation, Quality and Efficiency			
<u>Rainwater system water quality</u>	<u>Field testing and verification</u>	<u>707.15.1</u>	<u>707.15.1</u>
<u>Gray water system water quality</u>	<u>Field testing and verification</u>	<u>708.13.8</u>	<u>708.13.8</u>
Chapter 8: Indoor Environmental Quality and Comfort			
<u>Building construction, features, operations and maintenance facilitation</u>			
<u>Air-handling system access</u>	<u>Field inspection and verification</u>	<u>18 - 24 months</u>	<u>802.2</u>
<u>Air-handling system filters</u>	<u>Field inspection and verification</u>	<u>18 - 24 months</u>	<u>802.3</u>
<u>HVAC systems</u>			
<u>Temperature and humidity in occupied spaces</u>	<u>Field inspection and verification</u>	<u>18 - 24 months</u>	<u>803.2</u>

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

This proposal removes all of the post-certificate of occupancy commissioning requirements from Table 903.1 and places them in a separate new appendix. That leaves only the commissioning that occurs at or prior to certificate of occupancy in Chapter 9.

Many jurisdictions find the post-certificate of occupancy commissioning requirements excessive and hesitate to adopt the IgCC on that basis. This proposal will improve adoptions, but leave an alternative in the code for those jurisdictions that find the post-certificate of occupancy requirements valuable.

Cost Impact: Will not increase the cost of construction

GG276-14 : TABLE 903.1-THOMPSON938

GG277-14

904.2

Proponent: Jason Wilen, representing National Roofing Contractors Association (NRCA)
(jwilen@nrca.net)

Revise as follows:

904.2 Record documents. The cover sheet of the record documents for the project shall clearly indicate that at least one copy of the materials shall be in the possession of the owner. Record documents shall include all of the following:

1. Copies of the *approved* construction documents, including plans and specifications.
2. As-built plans and specifications indicating the actual locations of piping, ductwork, valves, controls, equipment, access panels, lighting, air barriers, and other similar components where they are concealed or are installed in locations other than those indicated on the *approved* construction documents.
3. For sites that have previously been a *brownfield*, or required environmental corrective action, remediation or restoration at the federal, state or local level, copies of engineering and institutional control information shall be provided.
4. A copy of the Certificate of Occupancy.

Reason: This code change proposal is intended to add air barriers to the list of items required on as-built plans and specifications. Determining the components serving as air barriers and their location within the building envelope is critical when future repairs or restorations are done so the air barrier can remain continuous.

Cost Impact: Will increase the cost of construction. The increase should be nominal if the air barriers are well documented in the approved construction documents.

GG277-14 : 904.2-WILEN776

GG278-14

904.3

Proponent: Jason Wilen, representing National Roofing Contractors Association (NRCA)
(jwilen@nrca.net)

Revise as follows:

904.3 Building operations and maintenance documents. The building operations and maintenance documents shall consist of manufacturer's specifications and recommendations, programming procedures and data points, narratives, and other means of illustrating to the owner how the building, site and systems are intended to be maintained and operated. The following information shall be included in the materials, as applicable to the specific project:

1. Directions to the owner or occupant on the manual cover sheet indicating that at least one copy of the materials shall be in the possession of the owner or occupant.
2. Operations and maintenance manuals for equipment, products and systems installed under or related to the provisions of Chapter 4 including, but not limited to, the following, as applicable:
 - 2.1. Vegetative shading, plantings associated with vegetative roofs and natural resource protections and setbacks.
 - 2.2. Water-conserving landscape and irrigation systems.
 - 2.3. Stormwater management systems.
 - 2.4. Permanent erosion control measures.
 - 2.5. Landscape or tree management plans.
3. Operations and maintenance documents for materials, products, assemblies and systems installed under or related to the provisions of this code for material resource conservation in accordance with Chapter 5 including, but not limited to, the following, as applicable:
 - 3.1. Care and maintenance instructions and recommended replacement schedule for flooring, including, but not limited to, carpeting, walk-off mats and tile.
 - 3.2. Care and maintenance instructions for natural materials including, but not limited to, wood, bio-based materials and stone.
 - 3.3. Available manufacturer's instructions on maintenance for:
 - 3.3.1. Exterior wall finishes.
 - 3.3.2. Roof coverings.
 - 3.3.3. Exterior doors, windows and skylights.
 - 3.4. Information and recommended schedule for required routine maintenance measures, including, but not limited to, painting and refinishing.
4. Operations and maintenance documents for equipment, products and systems installed under or related to the provisions of this code for energy conservation in accordance with Chapter 6 including, but not limited to, the following:
 - 4.1. Heating, ventilating and air-conditioning systems including:
 - 4.1.1. Recommended equipment maintenance schedule.
 - 4.1.2. Air filters and fluid filters, including recommended replacement schedule and materials.
 - 4.1.3. Time clocks, including settings determined during commissioning.
 - 4.1.4. Programmable controls and thermostats, including settings determined during commissioning.
 - 4.2. Domestic hot water systems including performance criteria and controls.
 - 4.3. *Building thermal envelope* systems including:
 - 4.3.1. Glazing systems inspection schedule.
 - 4.3.2. Performance criteria for replacements and repairs.
 - 4.3.3. Information and recommended schedule on required routine maintenance measures, including but not limited to, sealants, mortar joints and screens.
 - 4.3.4. Roof covering inspection schedule.
 - 4.4. Electrical and lighting systems including:

- 4.4.1. Technical specifications and operating instructions for installed lighting equipment.
- 4.4.2. Luminaire maintenance and cleaning plan.
- 4.4.3. Lamp schedule, recommended relamping plan, and lamp disposal information.
- 4.4.4. Programmable and automatic controls documentation, including settings determined during commissioning.
- 4.4.5. Occupant sensor and daylight sensors documentation, including settings determined during commissioning.
- 4.5. Automatic demand reduction systems.
- 4.6. Solar photovoltaic systems.
- 5. Operations and maintenance documents for equipment, products and systems installed under or related to the provisions of this code for water conservation in accordance with Chapter 7, including, but not limited to the following:
 - 5.1. Domestic fixtures.
 - 5.2. Water-regulating devices including faucets and valves.
 - 5.3. Irrigation and rainwater and gray water catchment.
- 6. Operations and maintenance documents for equipment products and systems under or related to the provisions of this code for indoor environmental quality in accordance with Chapter 8, including, but not limited to, the following:
 - 6.1. Humidification/dehumidification.
 - 6.2. Green cleaning products, procedures and techniques.
 - 6.3. Recommended window cleaning schedule.
 - 6.4. Ventilation controls.
 - 6.5. Floor finishes.
 - 6.6. Fireplaces and combustion appliances.

Reason: This code change proposal is intended to clarify the Code's intent and to add two items to the list of required building operations and maintenance documents.

The change in Section 904.3, 2, 2.1 is to clarify that the section applies to plantings and not the roof covering. Text related to the roof covering is proposed for section 4.3. Information about Solar photovoltaic systems is proposed for section 4.1.

Documents related to planting material, roof coverings and photovoltaic systems are typically available from manufacturers and should be included with the document package provided to an owner.

Cost Impact: Will not increase the cost of construction.

GG278-14 : 904.3-WILEN841

GG279-14

904.4 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org); Ryan Meres (ryan@imt.org)

Add new text as follows:

904.4 Building staff training. The building superintendent, building manager or other person who has primary responsibility for on-site supervision of building maintenance shall be required to hold a valid certificate or certification in energy efficient building operation from a recognized program in this area. Prior to the issuance of the Certificate of Occupancy, and every three years after the date of the Certificate of Occupancy, the building owner shall provide to the code official a letter stating the name of such person, the name of the program issuing such certificate, the expiration date of such certificate, and a number or code that uniquely identifies the individual holding such certificate.

Reason: Buildings can substantially reduce energy use if they are run by people who understand energy efficient building operations. Studies have shown that, after building personnel are provided with energy efficiency training, energy use in a building can be reduced as much as 15%. This proposal would require all buildings to have a person with such training in a supervisory role. A similar regulation is pending in New York City.

Bibliography:

Urban Green Council, Green Codes Task Force, Energy Operations Proposal 3 ([Proposal](#))
Green Supers: The Critical Role of Energy Efficiency Training, 1199 SEIU Local 32BJ, 2013 ([Website](#))

Cost Impact: Will not increase the cost of construction.

GG279-14 : 904.4 (NEW)-SCHEIB1153

GG 280-14

1001, 1002, 1003, 1004, 1005, 1006, 1007, 1101, 1102, 1103, 1104, 1105

Proponent: Craig Conner, self, representing self (craig.conner@mac.com)

Delete without substitution:

~~SECTION 1001
GENERAL~~

~~SECTION 1002
ADDITIONS~~

~~SECTION 1003
ALTERATIONS TO EXISTING BUILDINGS~~

~~SECTION 1004
CHANGE OF OCCUPANCY~~

~~SECTION 1005
HISTORIC BUILDINGS~~

~~SECTION 1006
DEMOLITION~~

~~SECTION 1007
JURISDICTIONAL REQUIREMENTS~~

~~SECTION 1101
GENERAL~~

~~SECTION 1102
ADDITIONS~~

~~SECTION 1103
ALTERATIONS TO EXISTING BUILDING SITES~~

~~SECTION 1104
CHANGE OF OCCUPANCY~~

~~1105
HISTORIC BUILDING SITES~~

Reason: The IGCC needs to be made more useable. Focusing on new buildings will make it more usable.

Cost Impact: Will not increase the cost of construction

GG 280-14 : CHAPTER 10-CONNER1205

GG281-14

1001.1

Proponent: Susan Gitlin, U.S. Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov)

Revise as follows:

1001.1 Scope. The provisions of this chapter shall control the alteration, repair, addition, maintenance and operation and change of occupancy of existing buildings and structures. Relocated existing buildings shall comply with Chapter 10 and Chapter 4. Existing building sites shall comply with Chapter 11.

Reason: The relocation of buildings will require a new site. There is nothing in Chapter 10 that provides protection for the site, but the site deserves protection to the same level as required for new construction. The intent of this code change proposal is to add that protection.

Cost Impact: Will increase the cost of construction. The code change proposal would increase the cost of construction for relocated buildings.

GG281-14 : 1001.1-GITLIN859

GG282-14

1001.1

Proponent: Marcelo Hirschler, gbh International, representing North American Flame Resistant Alliance (gbhint@aol.com)

Revise as follows:

1001.1 Scope. The provisions of this chapter and the *International Existing Building Code®* shall control the alteration, repair, addition, maintenance and operation and change of occupancy of existing buildings and structures. Relocated existing buildings shall comply with Chapter 10. Existing building sites shall comply with Chapter 11.

Reason: Compliance with the IEBC is not mentioned anywhere in the IgCC. In fact, there are only 2 references to the IEBC in the code, sections 102.4 and 102.6. Neither section mandates that existing buildings (and changes thereto) must comply with the IEBC. This code proposal clarifies this.

Section 102.4 states as follows (before the proposed modification):

102.4 Referenced codes and standards. *The following codes shall be considered part of the requirements of this code: the International Building Code, the International Code Council Performance Code® (ICCPC®), the International Energy Conservation Code® (IECC®), the International Existing Building Code® (IEBC®), the International Fire Code® (IFC®), the International Fuel Gas Code® (IFGC®), the International Mechanical Code® (IMC®), the International Plumbing Code® (IPC®), International Property Maintenance Code® (IPMC®), and the International Residential Code® (IRC®).*

Section 102.6 states as follows:

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

It is sort of implicit by the wording of the references to the IEBC that changes to an existing building must comply with the IEBC but it needs to be made explicit.

Cost Impact: Will not increase the cost of construction

GG282-14 : 1001.1-HIRSCHLER952

GG283-14

1001.2

Proponent: Marcelo Hirschler, gbh International, representing North American Flame Resistant Alliance (gbhint@aol.com)

Revise as follows:

1001.2 Building operation and maintenance. Previously commissioned buildings and parts thereof, shall be operated and maintained in conformance to the code edition applicable at the time of construction. The owner shall be responsible for the operation and maintenance of existing buildings. The requirements of this chapter shall not provide the basis for removal or abrogation of fire protection and safety systems and devices or for the lowering of fire safety requirements associated with building elements, insulation, interior finish or other materials contained in existing structures.

Reason: The code proposal clarifies that the intent of this section is to apply to both active and passive fire protection features. The present wording focuses exclusively on the fire protection systems (such as sprinklers, smoke alarms, smoke control systems and so on). Clearly they must remain in place when an existing building comes into compliance with the IgCC. However other fire safety features must also remain in place. In other words, it is not appropriate for changes to be made in order to comply with the IgCC that would lower fire safety features such as fire resistance ratings of building elements, fire ratings of roofs, flame spread and smoke development of interior finish, flame spread across exterior insulation systems, and so on.

Cost Impact: Will not increase the cost of construction

GG283-14 : 1001.2-HIRSCHLER953

GG284-14

1001.3, 1001.3.1 (New), 1001.3.2 (New), 1001.3.3 (New), 1003.2

Proponent: Brenda Thompson, Chair, Sustainability, Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

1001.3 Compliance. Alterations, repairs, additions and changes of occupancy to existing structures shall comply with the provisions of this chapter. Where such work is undertaken, compliance with Sections 1001.3.1, 1001.3.2 and 1001.3.3 shall be required.

Exceptions:

1. Where the application of the requirements of Sections 1001.3.1, 1001.3.2 and 1001.3.3 to the unaltered spaces are determined by the *code official* to be infeasible based upon the existing configuration of spaces.
2. Materials, assemblies and components regulated by Sections 1001.3.1, 1001.3.2 and 1001.1.3.3 that are dependent upon properties of other concealed materials, assemblies or system components to function properly and where the properties of the concealed materials, assemblies or components are unknown or insufficient and will not be revealed during construction.
3. Where a tenant in a multi-tenant *building* does not have control within that tenant space of a complete system or item, compliance for that complete system or item shall not be required.

Add new text as follows:

1001.3.1 Heating, ventilation and air conditioning. Heating, *ventilation* and air conditioning systems and equipment shall be in accordance with the following:

1. Non-functioning thermostats shall be repaired or replaced.
2. Leaking accessible supply air and return ducts shall be sealed in accordance with Section 606.3 with *approved* sealants.
3. Outside air dampers, damper controls and linkages controlled by HVAC units shall be in good repair and adjustment.
4. Hot water and steam leaks, defective steam traps and radiator control, relief, and vent valves in accessible piping shall be repaired or replaced.
5. Leaking accessible chilled water lines and equipment shall be repaired or replaced.
6. The programming of the building management systems (BMS) shall be tested and verified to confirm that schedules, alarms, lockouts and other performance algorithms operate as intended for the building.
7. Furnace combustion units shall have been cleaned and tuned within one year prior to the alteration. Filters shall be replaced in accordance with the furnace manufacturer's recommendations.
8. Chiller systems shall have been cleaned and tuned within one year prior to the alteration.
9. For motor-driven systems and equipment, filters shall be cleaned or replaced, and belts and other coupling systems shall be repaired.

1001.3.2 Service water systems. Defective hot and cold water piping and equipment within service water systems shall be repaired or replaced as follows:

1. The water supply shall meet the minimum flow and temperature requirements of the *International Plumbing Code* or the code in force at the time the building was constructed.

2. Leaking pipes, valves and equipment shall be repaired or replaced.

1001.3.3 (New) Motor-driven equipment. Leaking compressed air or pumped water systems shall be repaired or replaced.

Revise as follows:

1003.2 Requirements for alterations. Alterations of portions or components of buildings shall comply with Sections 1001.3 and 1003.2.1 through 1003.2.7.

Exceptions:

1. The total cost of improvements required by Sections 1003.2.1 through 1003.2.7 shall not be required to exceed 10 percent of the costs of the alterations exclusive of land and building site improvements. The costs of alterations shall include costs related to Section 1001.3, but shall not limit its application.
2. This section shall not require compliance that exceeds that required for systems regulated by Chapters 6 through 8 of this code.
3. Materials, assemblies and components regulated by Sections 1003.2.1 through 1003.2.7 that are dependent upon properties of other concealed materials, assemblies or system components to function properly and where the properties of the concealed materials, assemblies or components are unknown or insufficient and will not be revealed during construction.
4. Alterations are not required to comply with the requirements of Sections 1003.2.1 through 1003.2.7 where the *code official* determines the alterations to be *infeasible* based upon the existing configuration of spaces, unless those spaces or portions thereof will be reconfigured as part of the alteration project.
5. Where a tenant in a multi-tenant building does not have control within that tenant space of a complete system or item, compliance for that complete system or item shall not be required.
6. Where the total cost of the alteration to the existing building is less than the percent of the value of the building as indicated in Table 1003.2, compliance with Sections 1003.2.1 through 1003.2.7~~1003.2~~ shall not be required. The percent value of the building shall be determined by the original construction cost plus completed improvement costs of the building.

Reason: Proponents in the 2011 IgCC code development cycle unintentionally deleted the basic minimum requirements for existing buildings that were required to be complied with whenever buildings were altered or added to. Those proponents, the Preview Group and AIA, were attempting to move these requirements in GG708 and assumed that deleting them in GG719 would be coordinated with that action. However, deletions overrule in the ICC code development process and, therefore, these provisions were not included in the 2012 IgCC.

This proposal reinstates the "minimum energy, HVAC and water requirements" for existing buildings that were contained in IgCC PV 2.0 and were unintentionally deleted by GG719. This proposal retains the reorganization proposed by GG708 and GG719. It also adds clarification to proposed Sections 1001.3.2 and 1001.3.3, as compared to the equivalent section in PC 2.0, that improves its enforceability. These provisions address basic minimum and relatively minor items, including requirements to repair plumbing and duct leakages and verify that thermostats are functioning, etc. The proposed provisions require that these items be addressed whenever existing buildings are altered, repaired, added to, or change occupancy. These provisions are generally beneficial to owners that intend to continue to operate their building in an efficient and cost effective manner over the buildings life. These provisions pose no hardship.

This proposal also includes changes to these sections other than those proposed by GG719 that were approved in the 2011 code development process and which, were it not for the unintended deletion of these requirements by GG719, would have become part of the 2012 IgCC.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related

documentation and reports are posted on the SEHPCAC website at:
<http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will increase the cost of construction. This proposal may increase the cost of construction.

GG284-14 : 1001.3-THOMPSON321

GG285-14

1001.3.1 (New), 1001.5 (New), 1001.6 (New), 1001.7 (New), 1003.2.2, 1004.1

Proponent: David Collins, The Preview Group, Inc., representing American Institute of Architects (dcollins@preview-group.com)

Add new text as follows:

1001.3.1 Compliance. Where permitted work other than a change of occupancy is undertaken, the items noted in Sections 1001.5, 1001.6 and 1001.7 shall be performed in accordance with the requirements of those sections.

1001.5 Heating, ventilation and air conditioning. Heating, ventilation and air conditioning systems and equipment shall be in accordance with the following:

1. Non-functioning thermostats shall be repaired or replaced.
2. Leaking accessible supply air and return ducts shall be sealed with approved sealants. Although the presence of existing duct tape shall not be deemed to indicate noncompliance where a duct is not leaking, duct tape shall not be acceptable for repair of such a leak.
3. Outside air dampers, damper controls and linkages controlled by HVAC units shall be in good repair and adjustment.
4. Hot water and steam leaks, defective steam traps, radiator controls, relief, and vent valves shall not be permitted in any accessible piping.
5. Leaking accessible chilled water lines and equipment shall be repaired or replaced.

1001.6 Service water systems. Defective hot and cold water piping and equipment within service water systems shall be repaired or replaced.

1001.7 Motor-driven equipment. Leaking equipment in compressed air or pumped water systems shall be repaired or replaced.

Revise as follows:

1003.2.2 Heating, ventilating and air-conditioning. Heating, ventilating and air-conditioning systems and equipment shall be in accordance with the following:

1. Furnace systems shall be cleaned and tuned as part of the alteration work. Filters shall be replaced in accordance with the furnace manufacturer's recommendations.

Exception: Furnace combustion units that have been cleaned and tuned within one year prior to the alteration.

42. Each heating and cooling system shall be provided with thermostatic controls. Time clock and automatic time switch controls that can turn systems off and on according to building occupancy requirements shall be provided and connected to the following HVAC equipment: chillers and other space-cooling equipment, chilled water pumps, boilers and other space-heating devices, hot water pumps, heat exchanger circulation pumps, supply fans, return fans, and exhaust fans. Where occupant override is provided, it shall be designed with a timer to automatically revert to time clock and automatic time switch controls in not longer than 12 hours.

Exception: A time clock or automatic time switch controls shall not be required for spaces where any of the following conditions exist:

1. A time clock is not required by Section C403.2.4.3 of the *International Energy Conservation Code*.
 2. There is 24-hour occupancy materials with special atmospheric requirements dependent on 24-hour space conditioning.
 3. A majority of the areas of the building served by the system are under setback thermostat control.
 4. Manufacturer's specifications stipulate that the system must not be shut off.
23. Functional outside air economizers shall be provided on all cooling systems of more than 4 ½ tons total cooling capability, 54,000 Btu/h, or more than 1800 cfm (9,144 m³/s @ m²) air flow, provided manufacturer's guidelines are available for adding the economizer to the existing system.

Exception: An outside air economizer shall not be required for buildings or special uses where 100 percent outside air for ventilation is required or where any of the following conditions exist:

1. Section C403.3.1 of the *International Energy Conservation Code* would not require an economizer.
 2. The existing system has a water-based economizer.
 3. The existing system does not have an outside air intake.
 4. Special economizer operations such as, but not limited to, carefully controlled humidity would require more energy use than is conserved.
 5. There is insufficient space to install necessary equipment.
 6. Installation of an economizer would require major modifications to the building's life safety system.
 7. The existing system is a multi-zone system where the same intake air is used at the same time for either heating or cooling in different parts of the building.
34. HVAC piping and ducts, including those located above suspended ceilings, shall comply with Sections 606.3 and 606.4.

Exception: Additional insulation shall not be required for piping where any of the following conditions exist:

1. Additional insulation shall not be required for piping where any of the following conditions exist:
 - 1.1. It is located within HVAC equipment;
 - 1.2. It is located within conditioned space that conveys fluids between 60°F (15.6°C) and 105°F (40.6°C);
 - 1.3. Piping that is already insulated and the insulation is in good condition; or
 2. Where HVAC ducts and piping are installed in a building cavity or interstitial framing space of insufficient width to accommodate the duct or pipe and the insulation required by Section 606.3 and Table 606.4, the insulation thickness shall be permitted to have the maximum thickness that the wall can accommodate, but shall not be less than ½ - inch (12.7 mm) thick.
45. Where central heat is intended to be replaced with individual electric space heaters, the application for the electrical permit shall include documentation demonstrating that the new electric heaters will not consume more energy than the existing nonelectric heaters.
56. Boiler systems shall have been cleaned and tuned within one year prior to the alteration. Boilers shall be equipped with an outdoor air lock-out thermostat or a temperature reset control.
67. Chiller systems shall be cleaned and turned as part of the alteration work. Chillers shall be equipped with an outdoor air lockout thermostat and chilled water reset control.

Exception: Chiller systems that have been cleaned and tuned within one year prior to the alteration shall not be required to be cleaned and tuned.

78. A maximum 5-year phase out plan shall be provided for buildings with existing systems that use CFC-based refrigerants.
89. Where mechanical and electrical systems and equipment are joined with microprocessors that communicate with each other or to a computer, a properly integrated building automation system shall be installed to optimize energy, operations, and indoor comfort. The building automation system shall:
- 8-19.1. Allow the owner to set up schedules of operation for the equipment and provide equipment optimal start with adaptive learning;
 - 8-29.2. Provide trim and respond capabilities based on zone demand;
 - 8-39.3. Offer the ability to monitor energy usage, including the ability to meter electric, gas, water, steam, hot water, chilled water, and fuel oil services;
 - 8-49.4. Offer economizing based on enthalpy calculation and/or CO₂ set point control;
 - 8-59.5. Offer load shedding when power companies are at peak demand and need; and
 - 8-69.6. Offer the ability to send alarms to alert building owner, manager, or operator when problems occur due to system failures.

Revise as follows:

1004.1 Change of occupancy. Where a change in occupancy of a building or tenant space places it in a different division of the same group of occupancy or in a different group of occupancies, as determined in accordance with the provisions of the *International Building Code*, compliance with Sections 1001.5, 1001.6 and 1001.7 ~~1001.3 and 1001.4~~ shall be required.

Exception: Historic buildings in accordance with Section 1005 shall not be required to comply with Section 1004.

Reason: The intent of the existing building provisions in the IgCC should require that any work done on an existing building results in an incremental improvement in the sustainable performance of the building. These proposed revisions will further that goal.

This first part of this proposed change adds to Section 1001 a set of readily undertaken improvements to existing buildings that would be triggered by any permitted work done on the building. These relatively simple and low-cost measures will result in improved building performance for existing buildings. The requirements are simple and rational and will yield measurable building performance improvements for minimal investments. The work would be done at a time when other permitted work is occurring on the building. The measures basically involve repairing deferred maintenance items like broken thermostats, replacing filters and verifying that ducts are sealed.

There are also additional requirements for alterations added to Section 1003.2.2. These items are somewhat more far reaching than the basic measures proposed in 1001 and are located in this section so that they would only be triggered by alteration work, not by minor work such as repairs or changes of occupancy.

This code change proposal also corrects references in the change of occupancy requirements in Section 1004.1 as a trigger for the basic work proposed to be included in Section 1001. Due to a mix-up in the adoption process for the last code edition the language in the current code in Section 1004.1 points to two irrelevant sections; 1001.3 and 1001.4. This reference needs to be revised.

The basic work in Section 1001 could also be triggered by a building sale. But since that measure is more controversial than the basic measures in this proposal we have addressed that trigger in a separate code change proposal.

Cost Impact: Will not increase the cost of construction.

GG285-14 : 1001.3.1 (NEW)-COLLINS760

GG286-14

1001.4

Proponent: Richard Miller, International Association of Fire Chiefs, representing FLSS IAFC
(rmiller@iafc.org)

Revise as follows:

1001.4 Existing materials, assemblies, configurations and systems. Materials, assemblies, configurations and systems already in use that conform to requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use ~~unless determined by the code official to be dangerous to life, health or safety. Where such conditions are determined to be dangerous to the environment, life, health or safety, they shall be mitigated or made safe.~~

Reason: This existing language sets up a direct conflict with the scope, intent and applicability of the IFC due to a lack of determination, clarity or guidance on the code official's perspective of what may constitute a danger to life, safety or health.
"This proposal is approved by the Fire-CAC, but not reviewed by the SEHP-CAC"

Cost Impact: Will not increase the cost of construction.

GG286-14 : 1001.4-MILLER446

GG287-14

1001.4

Proponent: Maureen Traxler, City of Seattle Dept of Planning & Development, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

1001.4 Existing materials, assemblies, configurations and systems. Materials, assemblies, configurations and systems already in use that conform to requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the *code official* to be dangerous to the environment, life, health or safety. Where such conditions are determined to be dangerous to the environment, life, health or safety, they shall be mitigated or made safe.

Reason: This proposal removes an internal inconsistency from Section 1001.4. The first sentence says the existing conditions may remain unless determined to be dangerous to life, health or safety. The next sentence requires those conditions to be corrected if they are unsafe to the environment in addition to life, health and safety. Section 101.5 states that the intent of the IgCC is to "safeguard the environment...and increase the positive impacts of the built environment on the natural environment..."

Note also that this proposal makes Section 1001.4 consistent with Section 1101.4.1 (numbered 1104.4.1 in 1st printing). Including harm to the environment is important and appropriate in the Green Construction Code.

Cost Impact: Will not increase the cost of construction.

GG287-14 : 1001.4-TRAXLER479

GG288-14

1002.1

Proponent: Susan Gitlin, US Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov)

Revise as follows:

1002.1 General. Additions to any site-built building or structure shall comply with the requirements of this code for new construction. ~~Any addition to a modular building that is relocated within or into a jurisdiction that is in compliance with requirements or approvals in effect at the time of its construction shall comply with Section 1002 of this code.~~ For modular buildings that are in compliance with the requirements or approvals in effect at the time of their construction and relocated within or into the jurisdiction, additions shall comply with Section 1003 and Chapter 4 of this code.

Reason: There are a few unclear and perhaps erroneous pieces to this section.

For example, the section is self-referential, referring the user to Section 1002. As 1002.1 is the entirety of Section 1002, this cannot be what the authors had intended. We assume that the authors intended to refer the user to Section 1003.

Also, the second sentence is a bit unwieldy. It contains multiple clauses that create confusion regarding which noun is being described. (Does “that is relocated” refer to “any addition” or to “a modular building”? Does “that is in compliance” refer to “jurisdiction or to “a modular building”?) In combination, a user is forced to read the section multiple times before it becomes semi-comprehensible.

Finally, as Section 1003 focuses on alterations and not on additions, it is not entirely clear whether such alterations would be required to comply with Chapter 4 (Site Development) of IgCC. In most alterations, the site may not be significantly affected, but if additions to modular structures are to be built in accordance with Section 1003, it is possible that additions could be built of significant size to affect the site. Therefore, it is appropriate that such additions be required to be built in accordance with Chapter 4.

This proposal aims to clarify the section and to require that additions to modular buildings that are newly moved into the jurisdiction comply with the Sites chapter of the code.

Cost Impact: Will not increase the cost of construction

GG288-14 : 1002.1-GITLIN861

GG289-14

1003.2, 1003.2.8 (New)

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Brickfield, Burchette, Ritts & Stone (gas@bbrslaw.com); Brian Dean (Brian.Dean@icfi.com); William Prindle (william.prindle@icfi.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello (misuriello@verizon.net)

Revise as follows:

1003.2 Requirements for alterations. Alterations of portions or components of buildings shall comply with Sections 1003.2.1 through 1003.2.78.

Exceptions:

1. The total cost of improvements required by Sections 1003.2.1 through 1003.2.7 shall not be required to exceed 10 percent of the costs of the alterations exclusive of land and building site improvements.
2. This section shall not require compliance that exceeds that required for systems regulated by Chapters 6 through 8 of this code.
3. Materials, assemblies and components regulated by Sections 1003.2.1 through 1003.2.7 that are dependent upon properties of other concealed materials, assemblies or system components to function properly and where the properties of the concealed materials, assemblies or components are unknown or insufficient and will not be revealed during construction.
4. Alterations are not required to comply with the requirements of Sections 1003.2.1 through 1003.2.7 where the *code official* determines the alterations to be *infeasible* based upon the existing configuration of spaces, unless those spaces or portions thereof will be reconfigured as part of the alteration project.
5. Where a tenant in a multi-tenant building does not have control within that tenant space of a complete system or item, compliance for that complete system or item shall not be required.
6. Where the total cost of the alteration to the existing building is less than the percent of the value of the building as indicated in Table 1003.2, compliance with Section 1003.2 shall not be required. The percent value of the building shall be determined by the original construction cost plus completed improvement costs of the building.

Add new text as follows:

1003.2.8 Insulation and fenestration criteria. New building thermal envelope components installed as alterations to existing buildings shall meet the applicable prescriptive requirements for U-factor, C-factor, F-factor and SHGC in Section 605.1.1.

Reason: This proposal applies a consistent set of prescriptive requirements to new thermal envelope components, regardless of whether they are installed in new construction or as part of an addition or alteration to an existing building. Section 1002: Additions already applies the requirements of the IgCC (including thermal envelope requirements) to the new portion of the building. However, there is not currently a provision that specifies thermal envelope requirements for alterations to existing buildings.

The scope of the IgCC is intended to cover "the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures ..." See Section 101.3. Although Section 1003.1 specifies that "Alterations to existing buildings and building systems shall be in accordance with the provisions of this code for those assemblies, systems and components being altered," and although there are several specific requirements for systems and lighting, there are no specific requirements for thermal envelope components in Section 1003. While it is reasonable to interpret the current code to require that new envelope components in an alteration must meet the same envelope requirements as in new construction, an additional section would clarify that requirement and bring more consistency to implementation.

To address any concerns that certain components would be infeasible based on the configuration of the existing building, Section 1003.2(4) already provides an exception for those situations. However, when an existing building is undergoing alteration, and new components are being installed, it is reasonable to require those components to achieve the same level of energy conservation as would be required for new construction or additions.

Cost Impact: Will increase the cost of construction

GG289-14 : 1003.2 #1-STONE912

GG290-14

1003.2, 1003.2.8 (New)

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Brickfield, Burchette, Ritts & Stone (gas@bbrslaw.com); Brian Dean (Brian.Dean@icfi.com); William Prindle (william.prindle@icfi.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello (misuriello@verizon.net)

Revise as follows:

1003.2 Requirements for alterations. Alterations of portions or components of buildings shall comply with Sections 1003.2.1 through 1003.2.7.8

Exceptions:

1. The total cost of improvements required by Sections 1003.2.1 through 1003.2.7 shall not be required to exceed 10 percent of the costs of the alterations exclusive of land and building site improvements.
2. This section shall not require compliance that exceeds that required for systems regulated by Chapters 6 through 8 of this code.
3. Materials, assemblies and components regulated by Sections 1003.2.1 through 1003.2.7 that are dependent upon properties of other concealed materials, assemblies or system components to function properly and where the properties of the concealed materials, assemblies or components are unknown or insufficient and will not be revealed during construction.
4. Alterations are not required to comply with the requirements of Sections 1003.2.1 through 1003.2.7 where the *code official* determines the alterations to be *infeasible* based upon the existing configuration of spaces, unless those spaces or portions thereof will be reconfigured as part of the alteration project.
5. Where a tenant in a multi-tenant building does not have control within that tenant space of a complete system or item, compliance for that complete system or item shall not be required.
6. Where the total cost of the alteration to the existing building is less than the percent of the value of the building as indicated in Table 1003.2, compliance with Section 1003.2 shall not be required. The percent value of the building shall be determined by the original construction cost plus completed improvement costs of the building.

Add new text as follows:

1003.2.8 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable prescriptive requirements for U-factor and SHGC in Section 605.1.1.

Reason: This proposal adds a simple requirement similar to the requirement that has been in the residential chapter of the IECC for a decade and was recently added to the 2015 IECC commercial chapter. See CE75-13. Window replacement is one of the most common and effective opportunities to significantly improve the energy efficiency of an existing building. While we believe the current Section 1003.1 already requires envelope components such as windows to meet the energy conservation requirements of Chapter 6 (among other requirements in the code), because window replacements are so common, it is important to clarify this by specifically calling out replacement fenestration in its own section.

There are already specific requirements outlined for other common alterations to the building, such as lighting (1003.2.4), insulation of unconditioned attics (1003.2.6), and roof replacement insulation (1003.2.7). This section does not require the replacement of windows. Where windows are replaced, however, the new windows will be required to meet the same level of efficiency as windows used in new construction. This is a simple clarification of code requirements that will lead to improved energy savings.

Cost Impact: Will increase the cost of construction

GG290-14 : 1003.2 #2-STONE914

GG291-14

1003.2

Proponent: Maureen Traxler, City of Seattle Dept of Planning & Development, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Revise as follows:

1003.2 Requirements for alterations. Alterations of portions or components of buildings shall comply with Sections 1003.2.1 through 1003.2.7.

Exceptions:

1. The total cost of improvements required by Sections 1003.2.1 through 1003.2.7 shall not be required to exceed 10 percent of the costs of the alterations exclusive of land and building site improvements.
2. This section shall not require compliance that exceeds that required for systems regulated by Chapters 6 through 8 of this code.
3. Materials, assemblies and components are not required to comply with ~~regulated by~~ Sections 1003.2.1 through 1003.2.7 that where they are dependent upon properties of other concealed materials, assemblies or system components to function properly, and where the ~~properties of the~~ concealed materials, assemblies or components ~~are unknown or insufficient and~~ will not be revealed during construction.
4. Alterations are not required to comply with the requirements of Sections 1003.2.1 through 1003.2.7 where the *code official* determines the alterations to be *infeasible* based upon the existing configuration of spaces, unless those spaces or portions thereof will be reconfigured as part of the alteration project.
5. Where a tenant in a multi-tenant building does not have control within that tenant space of a complete system or item, compliance for that complete system or item shall not be required.
6. Where the total cost of the alteration to the existing building is less than the percent of the value of the building as indicated in Table 1003.2, compliance with Section 1003.2 shall not be required. The percent value of the building shall be determined by the original construction cost plus completed improvement costs of the building.

Reason: This proposal clarifies exception 3, and makes it a complete sentence like the other exceptions to Section 1003.2. The proposal also makes a slight change so materials that won't be revealed during construction are not required to comply.

Cost Impact: Will not increase the cost of construction

GG291-14 : 1003.2-TRAXLER111

GG292-14

1003.2.1

Proponent: Karen Hobbs, Natural Resources Defense Council, representing Natural Resources Defense Council (khobbs@nrdc.org)

Revise as follows:

1003.2.1 Metering devices. Dedicated individual utility or private metering devices that measure and verify energy and water use within the building or space shall be provided for electrical energy and water consumption for individual tenant spaces and at least one of the following:

- ~~1. Electrical energy consumption for individual tenant spaces.~~
- ~~2. Water consumption for individual tenant spaces.~~
13. Natural gas or fuel oil consumption for individual tenant spaces.
24. Lighting loads.
35. Motor and drive loads.
46. Chiller part-load efficiency.
57. Cooling loads.
68. Economizer and heat recovery loads.
79. Boiler efficiencies.
840. Building process systems and equipment loads.
944. Water consumption for landscape irrigation.

Reason: When an existing building is undergoing sufficient alteration, repair, addition, maintenance and operation to trigger this code, the installation of energy and water meters for each individual tenant space should be required, not an option.

Meters provide building residents, owners and operators with critical data to: reduce energy/water/utility use; reduce energy/water/utility costs; improve overall building operations, including targeting of needed repairs; and improves equipment operations.

Metering electric and water use is the single most effective conservation measure. Unmetered water consumption is reduced 15-30 percent when metering and commodity rates are implemented. Metering individual tenant spaces for water supports the early detection and repair of leaks and damaged fixtures which can contribute to hazardous and unsafe conditions such as mold growth, bathroom slip and fall, and ice accumulation.

Bibliography:

Alliance for Water Efficiency, <http://www.allianceforwaterefficiency.org/1Column.aspx?id=708&terms=metering>

"Release 3.0: Operations and Maintenance Best Practices, A Guide to Achieving Operational Efficiency," U.S. Department of Energy, Federal Energy Management Program, August, 2010.
http://www1.eere.energy.gov/femp/pdfs/omguide_complete.pdf

Cost Impact: Will increase the cost of construction. According to the U.S. Department of Energy, the average installed cost of an electric meter is \$1,500; the Alliance for Water Efficiency estimates that installed water meters meeting standards set by the American Water Works Association and state regulatory requirements cost \$220-800. Other issues, including the location of the service line, affected hardscapes, and the possible need for rewriting, could increase or decrease those costs.

GG292-14 : 1003.2.1-HOBBS808

GG293-14

1003.2.1

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

1003.2.1 Metering devices. Dedicated individual utility or private metering devices that measure and verify energy ~~and or~~ water use within the building or space shall be provided for at least one of the following for each type of energy used in the building:

1. Electrical energy consumption for individual tenant spaces.
2. Water consumption for individual tenant spaces.
3. Natural gas, propane, or fuel oil consumption for individual tenant spaces.
4. Lighting ~~loads~~.
5. Motors and drives ~~loads~~.
6. Chiller part ~~load~~ efficiency.
7. Cooling system ~~loads~~.
8. Economizer and heat recovery system ~~loads~~.
9. Boiler / furnace ~~efficiencies~~ efficiency.
10. Building process systems and equipment ~~loads~~.
11. Water consumption for landscape irrigation.
12. Heating system.
13. Water consumption for heating and cooling equipment.
14. Water consumption for building process systems and equipment.

Exception: Metering devices are not required for buildings that are less than 25,000 square feet (2323 m²) in total building floor area.

Reason: The proposed changes will ensure that all forms of energy used in a building, not just one form of energy (that could represent less than 10% of the total energy usage of the building), are covered by this requirement.

The changes will help to close loopholes in the current requirement.

In addition, edits are made to clarify the intent of the metering provision. For example, metering equipment measures efficiency at all loads, not just at part load. Also, a meter would measure the efficiency of the cooling system, not the cooling load.

There are also additions that will provide more options and more flexibility to the building owner to meet this provision.

The language on buildings that are less than 25,000 square feet is consistent with the philosophy of the submetering requirements shown in Chapter 6. New buildings under 25,000 square feet are required to have the infrastructure to be submetered at a later date, but are not required to install submetering equipment.

Cost Impact: Will increase the cost of construction. Costs will be increased for buildings equal to or greater than 25,000 square feet that use two types of energy (e.g., electricity and natural gas). However, costs will be decreased for buildings that are less than 25,000 square feet.

GG293-14 : 1003.2.1-ROSENSTOCK526

GG294-14

1003.2.2

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

1003.2.2 Heating, ventilating and air-conditioning. Heating, ventilating and air-conditioning systems and equipment shall be in accordance with the following:

1. Time clock and automatic time switch controls that can turn systems off and on according to building occupancy requirements shall be provided and connected to the following HVAC equipment: chillers and other space-cooling equipment, chilled water pumps, boilers and other space-heating devices, hot water pumps, heat exchanger circulation pumps, supply fans, return fans, and exhaust fans. Where occupant override is provided, it shall be designed with a timer to automatically revert to time clock and automatic time switch controls in not longer than 12 hours.

Exception: A time clock or automatic time switch controls shall not be required for spaces where any of the following conditions exist:

1. A time clock is not required by Section C403.2.4.3 of the *International Energy Conservation Code*.
 2. There is 24-hour occupancy materials with special atmospheric requirements dependent on 24-hour space conditioning.
 3. A majority of the areas of the building served by the system are under setback thermostat control.
 4. Manufacturer's specifications stipulate that the system must not be shut off.
 5. Group I-2, Condition 2 occupancies
2. Functional outside air economizers shall be provided on all cooling systems of more than $4\frac{1}{2}$ tons total cooling capability, 54,000 Btu/h, or more than 1800 cfm ($9,144 \text{ m}^3/\text{s} @ \text{m}^2$) air flow, provided manufacturer's guidelines are available for adding the economizer to the existing system.

Exception: An outside air economizer shall not be required for buildings or special uses where 100 percent outside air for ventilation is required or where any of the following conditions exist:

1. Section C403.3.1 of the *International Energy Conservation Code* would not require an economizer.
 2. The existing system has a water-based economizer.
 3. The existing system does not have an outside air intake.
 4. Special economizer operations such as, but not limited to, carefully controlled humidity would require more energy use than is conserved.
 5. There is insufficient space to install necessary equipment.
 6. Installation of an economizer would require major modifications to the building's life safety system.
 7. The existing system is a multi-zone system where the same intake air is used at the same time for either heating or cooling in different parts of the building.
3. HVAC piping and ducts, including those located above suspended ceilings, shall comply with Sections 606.3 and 606.4.

Exception: Additional insulation shall not be required for piping where any of the following conditions exist:

1. Additional insulation shall not be required for piping where any of the following conditions exist:
 1. It is located within HVAC equipment;
 2. It is located within conditioned space that conveys fluids between 60°F (15.6°C) and 105°F (40.6°C);
 3. Piping that is already insulated and the insulation is in good condition; or
2. Where HVAC ducts and piping are installed in a building cavity or interstitial framing space of insufficient width to accommodate the duct or pipe and the insulation required by Section 606.3 and Table 606.4, the insulation thickness shall be permitted to have the maximum thickness that the wall can accommodate, but shall not be less than ½ inch (12.7 mm) thick.
4. Where central heat is intended to be replaced with individual electric space heaters, the application for the electrical permit shall include documentation demonstrating that the new electric heaters will not consume more energy than the existing nonelectric heaters.
5. Boiler systems shall have been cleaned and tuned within one year prior to the alteration. Boilers shall be equipped with an outdoor air lock-out thermostat or a temperature reset control.
6. Chillers shall be equipped with an outdoor air lockout thermostat and chilled water reset control.
7. A maximum 5-year phase out plan shall be provided for buildings with existing systems that use CFC-based refrigerants.
8. Where mechanical and electrical systems and equipment are joined with microprocessors that communicate with each other or to a computer, a properly integrated building automation system shall be installed to optimize energy, operations, and indoor comfort. The building automation system shall:
 - 8.1. Allow the owner to set up schedules of operation for the equipment and provide equipment optimal start with adaptive learning;
 - 8.2. Provide trim and respond capabilities based on zone demand;
 - 8.3. Offer the ability to monitor energy usage, including the ability to meter electric, gas, water, steam, hot water, chilled water, and fuel oil services;
 - 8.4. Offer economizing based on enthalpy calculation and/or CO₂ set point control;
 - 8.5. Offer load shedding when power companies are at peak demand and need; and
 - 8.6. Offer the ability to send alarms to alert building owner, manager, or operator when problems occur due to system failures.

Reason: Hospitals are operational 24 hours a day, 365 day per year and are required to maintain air pressure relationships continuously. Air pressure relationships are essential for maintaining hygienic conditions and preventing the airborne transmission of disease within these facilities. The HVAC system is primary means for maintaining these systems. The air handlers must resupply fresh air, exhaust systems must remove contaminated air 24/7. Putting a time switch or automatic clock control on these systems would create an unacceptable risk of infection. This would also directly conflict with state licensing and certification requirements in most states.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

GG 294-14 : 1003.2.2-PAARLBERG667

GG295-14

1003.2.2

Proponent: Margaret Padgitt, representing Midwest Chimney Safety Council
(margepadgitt@comcast.net)

Revise as follows:

1003.2.2 Heating, ventilating and air-conditioning. Heating, ventilating and air-conditioning systems and equipment shall be in accordance with the following:

1. Time clock and automatic time switch controls that can turn systems off and on according to building occupancy requirements shall be provided and connected to the following HVAC equipment: chillers and other space-cooling equipment, chilled water pumps, boilers and other space-heating devices, hot water pumps, heat exchanger circulation pumps, supply fans, return fans, and exhaust fans. Where occupant override is provided, it shall be designed with a timer to automatically revert to time clock and automatic time switch controls in not longer than 12 hours.

Exception: A time clock or automatic time switch controls shall not be required for spaces where any of the following conditions exist:

1. A time clock is not required by Section C403.2.4.3 of the *International Energy Conservation Code*.
2. There is 24-hour occupancy materials with special atmospheric requirements dependent on 24-hour space conditioning.
3. A majority of the areas of the building served by the system are under setback thermostat control.
4. Manufacturer's specifications stipulate that the system must not be shut off.
2. Functional outside air economizers shall be provided on all cooling systems of more than $4\frac{1}{2}$ tons total cooling capability, 54,000 Btu/h, or more than 1800 cfm (9.144 m³/s @ m²) air flow, provided manufacturer's guidelines are available for adding the economizer to the existing system.

Exception: An outside air economizer shall not be required for buildings or special uses where 100 percent outside air for ventilation is required or where any of the following conditions exist:

1. Section C403.3.1 of the *International Energy Conservation Code* would not require an economizer.
2. The existing system has a water-based economizer.
3. The existing system does not have an outside air intake.
4. Special economizer operations such as, but not limited to, carefully controlled humidity would require more energy use than is conserved.
5. There is insufficient space to install necessary equipment.
6. Installation of an economizer would require major modifications to the building's life safety system.
7. The existing system is a multi-zone system where the same intake air is used at the same time for either heating or cooling in different parts of the building.
3. HVAC piping and ducts, including those located above suspended ceilings, shall comply with Sections 606.3 and 606.4.

Exception: Additional insulation shall not be required for piping where any of the following conditions exist:

1. Additional insulation shall not be required for piping where any of the following conditions exist:
 - 1.1. It is located within HVAC equipment;
 - 1.2. It is located within conditioned space that conveys fluids between 60°F (15.6°C) and 105°F (40.6°C);
 - 1.3. Piping that is already insulated and the insulation is in good condition; or
2. Where HVAC ducts and piping are installed in a building cavity or interstitial framing space of insufficient width to accommodate the duct or pipe and the insulation required by Section 606.3 and Table 606.4, the insulation thickness shall be permitted to have the maximum thickness that the wall can accommodate, but shall not be less than ½ inch (12.7 mm) thick.
4. Where central heat is intended to be replaced with individual electric space heaters, the application for the electrical permit shall include² documentation demonstrating that the new electric heaters will not consume more energy than the existing nonelectric heaters.
5. Boiler systems shall have been cleaned and tuned within one year prior to the alteration. Boilers shall be equipped with an outdoor air lock-out thermostat or a temperature reset control.
6. Chillers shall be equipped with an outdoor air lockout thermostat and chilled water reset control.
7. A maximum 5-year phase out plan shall be provided for buildings with existing systems that use CFC-based refrigerants.
8. Where mechanical and electrical systems and equipment are joined with microprocessors that communicate with each other or to a computer, a properly integrated building automation system shall be installed to optimize energy, operations, and indoor comfort. The building automation system shall:
 - 8.1. Allow the owner to set up schedules of operation for the equipment and provide equipment optimal start with adaptive learning;
 - 8.2. Provide trim and respond capabilities based on zone demand;
 - 8.3. Offer the ability to monitor energy usage, including the ability to meter electric, gas, water, steam, hot water, chilled water, and fuel oil services;
 - 8.4. Offer economizing based on enthalpy calculation and/or CO₂ set point control;
 - 8.5. Offer load shedding when power companies are at peak demand and need; and
 - 8.6. Offer the ability to send alarms to alert building owner, manager, or operator when problems occur due to system failures.
9. Where chimney flues serving heating appliances or decorative appliances are uncapped, a stainless steel or aluminum chimney cover shall be installed to keep damaging rain, leaves, twigs, debris, birds and animals out of the flue.

Reason: As chimney sweeps servicing chimney flues we have long noticed the impact that the lack of a chimney cover has on chimney flues venting heating and decorative wood and gas-burning appliances. Without a proper chimney cover installed rain, birds, nests, twigs, animals, and debris can enter a chimney and can cause expensive damage and dangerous blockages that restrict the flow of flue gasses. Rain washes out mortar joints, allowing toxic heated flue gasses to escape the flue and enter the home. Bird nests and twigs are fire hazards. Debris and dead animals and birds can clog chimneys, causing toxic Carbon Monoxide to back up. Chimney sweeps from all over the country report these same issues. If a chimney cover were required on all chimney flues, it would save thousands of dollars in repairs, and help prevent dangerous blockages. The photos attached show washed out mortar joints in vitreous clay tile flue liners.

The NFPA 211 Standard for Chimneys, Vents, and Solid Fuel Burning Appliances Section 4.6.4.2 states "Where part of a listed chimney termination system, spark arresters shall be constructed and installed in accordance with the listing." The chimney liner and chimney manufacturers obviously know the impact an exposed chimney has and require a cover with their product.

The NFPA 211 Standard also mentions Caps and Spark Arrestors for Chimneys and vents in section 4.6.1, 4.6.2, 4.6.3 and 4.6.4 regarding deign, rain cap height, screening, and spark arrestors. However, there is no requirement that a cap must be installed (this will be proposed soon). It is clear that the NFPA has been considering the effects of chimney covers.

Bibliography:

Chimney Safety Institute of America www.csia.org
 Midwest Chimney Safety Council www.mcsc-net.org

Cost Impact: Will increase the cost of construction. The cost impact would be less than \$200 for each flue in most cases. For chimneys with multiple flues a custom-made chimney cover may be necessary at a cost of \$300 - \$2,000 depending on the size of the chimney and number of flues covered.

GG295-14 : 1003.2.2-PADGITT902

GG296-14

1003.2.5

Proponent: Jennifer Hatfield, Association of Pool & Spa Professionals, representing Association of Pool & Spa Professionals (jhatfield@apsp.org)

Revise as follows:

1003.2.5 Swimming pools and spas. Swimming pools and spas and their equipment shall be in accordance with the following:

1. Outdoor heated swimming pools and outdoor permanent spas shall be equipped provided with a vapor retardant cover listed and labeled in accordance with ASTM F 1346, or a liquid pool cover feed system, for unoccupied hours or other approved vapor retardant means in accordance with Section 105.1.

Exception: A cover shall not be required for indoor pools or spas in which water temperature is less than 80°F (26.7°C) during time of nonuse. Where more than 70 percent of the energy for heating, computed over an operating season, is from site-recovered energy such as from a heat pump or solar energy source, covers or other vapor retardant means shall not be required.

2. Backwash systems shall be based on pressure drop and shall not be based on a timer.
3. Pool and spa recirculation pumps shall be under timeclock control.

Exception: Filtration pumps where the public health standard requires 24-hour pump operation.

4. Heaters shall have been cleaned and tuned for efficiency within one year prior to the alteration. Where this has not been done, the heaters shall be cleaned and tuned as part of the alteration work.

Reason: The ASTM F 1346 Standard applies to safety pool covers, which is covered under Section 305 of the International Swimming Pool & Spa Code. A vapor retardant cover used to reduce heat loss and evaporation may not qualify as a safety cover. Section 303.3 of the ISPSC addresses covers for energy efficiency purposes.

This code change ensures consistency with the ISPSC requirements found in Section 303.3, as well as the cover requirements found in Sections C404.7.3 and R403.9.3 of the IECC.

If a consumer chooses to purchase a cover that complies with both the safety and energy provisions than it will be a cover that complies with ASTM F 1346. However, if they have chosen another means of barrier protection, per Section 305 of the ISPSC, they can then utilize a vapor retardant cover that is not meant for barrier protection but that provides the intent of the energy efficiency and water conservation requirements of this section of the IgCC.

Cost Impact: Will not increase the cost of construction

GG 296-14 : 1003.2.5-HATFIELD1063

GG297-14

1003.2.7, 605.2.

Proponent: Mike Fischer, Kellen Company, representing Center for the Polyurethanes Industry (mfischer@kellencompany.com)

Revise as follows:

605.2. Roof replacement. Above-deck insulation for roof replacement on an existing building where the existing roof assembly is part of the *building thermal envelope* and contains with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (17 percent slope) shall be in accordance with Section 1003.2.7.

Revise as follows:

1003.2.7 Roof replacement insulation. For *roof replacement*, where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above deck, roof replacement shall include compliance with the requirements of Table C402.1.2 or Table C402.2 of the *International Energy Conservation Code*.

~~For roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (16 percent slope), the insulation shall conform to the energy conservation requirements for insulation entirely above deck in the *International Energy Conservation Code*.~~

~~**Exception:** Where the required R-value cannot be provided due to thickness limitations presented by existing rooftop conditions, including heating, ventilating and air conditioning equipment, low door or glazing heights, parapet heights, proper roof flashing heights, the maximum thickness of insulation compatible with the available space and existing uses shall be installed.~~

Reason: The 2012 IgCC contains provisions for roof replacement that differ from the recently approved clarification language in the 2015 IECC (see CE15-13). This proposal is necessary to align the two codes. The exceptions for slope and technical feasibility are removed since those options are not part of the base code and to remove a conflict because compliance to the IECC for envelope requirements is required by Section 605.1.

This proposal modifies the current Chapter 6 requirements and also inserts the new language in the 2015 IECC that directly addresses roof replacement.

The base technical requirement for the 2012 IgCC's thermal envelope requirements is a 10% reduction (improvement) in U-factor, but roof replacement in the IgCC is required only to upgrade to the current IECC code level for R Value or U-Factor. This consideration is an important acknowledgement of issues facing roofing contractors when reroofing. Furthermore, the IgCC Section 605.1.1 does not include instructions for R-Value increases to achieve a 10% improvement over the IECC. While that distinction is important because of the difficulty in applying a 1.1 multiplier to R-Values for assemblies where framing factors and other variables affect the installed thermal resistance of the assembly, roof replacement for insulation entirely above deck is considered to be a *continuous* insulation material. By retaining Table C402.2 (R- Value) of the IECC in the new language in Section 1003.2.7, this proposal will keep compliance for reroofing under the IgCC a simpler process while maintaining equivalent energy efficiency. Reroofing is one of the most common commercial building renovations; it is critical that compliance be streamlined for those projects.

Cost Impact: Will not increase the cost of construction

GG297-14 : 1003.2.7#1-FISCHER872

GG298-14

1003.2.7, 605.1.1, 605.2.

Proponent: Mike Fischer, Kellen Company, representing The Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

Revise as follows:

605.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall exceed the requirements of Tables C402.1.2 and C402.3 of the *International Energy Conservation Code* by not less than 10 percent. Specifically, for purposes of compliance with this code, each U-factor, C-factor, F-factor and SHGC in the specified tables shall be reduced by 10 percent to determine the prescriptive criteria for this code. In Sky Type "C" locations specified in Section 808.4, the skylights shall not exceed 5 percent of the building roof area.

Exception: For roof replacement, where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above deck, roof replacement shall include compliance with the requirements of the *International Energy Conservation Code*.

~~**605.2. Roof replacement.** Above-deck insulation for roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (17 percent slope) shall be in accordance with Section 1003.2.7.~~

Delete without substitution:

~~**1003.2.7 Roof replacement insulation.** For roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (16 percent slope), the insulation shall conform to the energy conservation requirements for insulation entirely above deck in the *International Energy Conservation Code*.~~

~~**Exception:** Where the required R-value cannot be provided due to thickness limitations presented by existing rooftop conditions, including heating, ventilating and air conditioning equipment, low door or glazing heights, parapet heights, proper roof flashing heights, the maximum thickness of insulation compatible with the available space and existing uses shall be installed.~~

Reason: This proposal corrects a discrepancy between the IgCC and recently approved changes to the IECC. The IgCC contains exceptions and limitations governing insulation for roof replacement which are not contained in the IECC. The proposal ensures that the IgCC is at least as efficient as the IECC, but maintains the option that roof replacement projects meet only the base IECC requirements; not a 10% higher level of efficiency.

Cost Impact: Will not increase the cost of construction

GG298-14 : 1003.2.7#2-FISCHER1104

GG299-14 202 (New), 1003.2.7

Proponent: Jason Wilen, National Roofing Contractors Association, representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

Revise as follows:

1003.2.7 Roof replacement insulation. For roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (16-percent slope), the insulation shall conform to the energy conservation requirements for insulation entirely above deck in the *International Energy Conservation Code*. Roof recover and roof repair shall not be subject to the provisions of this section.

Exception: Where the required R-value cannot be provided due to thickness limitations presented by existing rooftop conditions, including heating, ventilating and air-conditioning equipment, low door or glazing heights, parapet heights, proper roof flashing heights, the maximum thickness of insulation compatible with the available space and existing uses shall be installed.

Add new definitions as follows:

SECTION 202 DEFINITION

ROOF RECOVER. The process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

Reason: The proposed added text for section 1003.2.7 clarifies the Code's intent. Section 1003.2.7 currently applies to "roof replacement", a term already defined in IgCC and requires new insulation to be installed to current R-value or U-factor requirements. "Roof Recover" and "Roof Repair" include activities such as fixing a roof leak, installing a reflective coating or other measures to allow an existing roof assembly to reach its intended useful life or to improve its sustainable attributes.

The proposed definitions will also appear in IECC 2015 (per proposal CE56-13 that was part of the consent agenda during the Group B Public Comment Hearing) and the inclusion of the terms in IgCC2015 will ensure the terms are defined the same way in each document.

Cost Impact: Will not increase the cost of construction.

GG299-14:1003.2.7 #1-WILEN844

GG300-14

605.2, 1003.2.7

Proponent: Jason Wilen, National Roofing Contractors Association, representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

Revise as follows:

605.2. Roof replacement. Above-deck insulation for roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (17 percent slope) shall be in accordance with Section 1003.2.7.

1003.2.7 Roof replacement insulation. For roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (16 percent slope), the insulation shall conform to the energy conservation requirements for insulation entirely above deck in the *International Energy Conservation Code*.

Exception: Where the required R-value cannot be provided due to thickness limitations presented by existing rooftop conditions, including heating, ventilating and air-conditioning equipment, low door or glazing heights, parapet heights, proper roof flashing heights, the maximum thickness of insulation compatible with the available space and existing uses shall be installed.

Reason: The existing code text for section 1003.2.7 was approved as a public comment for proposal GG722-11 at the 2011 IgCC Final Action Hearings. In the reason statement for the approved public comment cited a peer reviewed document: *The Energy and Environmental Potential of Commercial Buildings: Implications for Energy Policy and Industry Growth through Green Building Market Transformation* by Phalan, J., Hoff, J., and Pavolvich, G (2010). In the report, it states only low-slope roofing was included in the market analysis. The report also acknowledges production figures compiled from the Polyisocyanurate Insulation Manufacturers Association (PIMA) were used to determine the extent of the commercial roof replacement market and for impact assessment calculations. The report makes clear the existing text in section 1003.2.7 primarily benefits the polyisocyanurate insulation industry. The report is included with this proposal as a reference.

The purpose of this code change is to ensure replacement roof systems comply with IECC roof insulation minimums in all cases and configurations. The proposed change preserves the exception so flexibility can be exercised by the code official when appropriate.

Cost Impact: Will increase the cost of construction.

GG300-14 : 1003.2.7#2-WILEN860

GG301-14

1003.2.7, 605.2.

Proponent: Jason Wilen, National Roofing Contractors Association, representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

Delete without substitution:

~~**605.2. Roof replacement.** Above-deck insulation for roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (17-percent slope) shall be in accordance with Section 1003.2.7.~~

~~**1003.2.7 Roof replacement insulation.** For roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (16-percent slope), the insulation shall conform to the energy conservation requirements for insulation entirely above deck in the *International Energy Conservation Code*.~~

~~**Exception:** Where the required R-value cannot be provided due to thickness limitations presented by existing rooftop conditions, including heating, ventilating and air conditioning equipment, low door or glazing heights, parapet heights, proper roof flashing heights, the maximum thickness of insulation compatible with the available space and existing uses shall be installed.~~

Reason: The purpose of this code change is to eliminate section 1003.2.7. "ROOF REPLACEMENT" is currently defined in IgCC and is limited to situations where the existing roof covering is removed, repairs to damaged substrate are completed and a new roof covering installed. In these cases IECC 2015 will already require the new roof system to comply with minimum insulation requirements within the code. The addition of definitions for "REROOFING", "ROOF RECOVER" and "ROOF REPAIR" (added to IECC for the 2015 edition via Proposal CE56-13 that was part of the consent agenda during the Group B Public Comment Hearings) add additional clarity for reroofing situations.

The existing section 1003.2.7 is equivalent to IECC 2015 requirements and therefore is not needed.

Cost Impact: Will not increase the cost of construction

GG301-14 : 1003.2.7#3-WILEN862

GG302-14

1003.2.8 (New), 605.3 (New)

Proponent: Amy Dickie, Global Cool Cities Alliance, representing Global Cool Cities Alliance (amy@globalcoolcities.org)

Add new text as follows:

605.3 Roof recovering and roof replacement. Roof products used to recover or replace roofs on an existing building where the roof slope is less than two units vertical in 12 units horizontal (17-percent slope) shall be in accordance with Section 1003.2.8.

1003.2.8 Roof solar reflectance and thermal emittance. Roof products used to recover or replace roofs on an existing building with roof slope of less than two units vertical in 12 units horizontal shall be in accordance with Section C402.3 of the *International Energy Conservation Code*.

Reason: This proposal adds a section to Ch 10 to require that roof products used for recovering and replacing roofs adhere to the solar reflectance and thermal emittance requirements in the International Energy Conservation Code (IECC).

There is evidence that installing cool roofs on low-sloped roofs in climate zones 1 through 3 provide significant net energy savings and net energy cost savings, as is evidence by their inclusion in IECC and ASHRAE 90.1. Additionally, reflective roofs provide benefits of reducing the urban heat island. These benefits are not currently captured for existing buildings. These proposed modifications to Chapter 10 ensure that when existing buildings with low-sloped roofs in climate zones 1 through 3 have an opportunity to recover or replace roofs, that they realize the multiple benefits of increased roof reflectivity.

This proposal also adds a new section (Section 605.3), which reference a new section of Chapter 10, so that roof recovering and roof replacements are required to adopt reflective roofs.

Cost Impact: Will not increase the cost of construction

GG302-14 : 1003.2.8(NEW)-DICKIE804

GG303-14

1004.1, 1104.1

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

Revise as follows:

1004.1 Change of occupancy. Where a change in occupancy of a building or tenant space places it in a different ~~division group~~ group of the same ~~group of occupancy classification~~ occupancy classification or in a different ~~group of occupancies~~ occupancy classification, as determined in accordance with the provisions of the *International Building Code*, compliance with Sections 1001.3 and 1001.4 shall be required.

Exception: Historic buildings in accordance with Section 1005 shall not be required to comply with Section 1004.

1104.1 Conformance. Where a change in the use or occupancy of a building or tenant space places it in a different ~~division group~~ group of the same ~~group of occupancy classification~~ occupancy classification, as determined in accordance with the provisions of the *International Building Code*, compliance with Section 1104.2 shall be required. Altered portions of, and additions to, existing buildings and existing building sites that are not a result of change of occupancy requirements, shall comply with Chapter 10 and this chapter.

Reason: The intent of this proposal is to align the terminology regarding occupancy classification and group between the IgCC and the IEBC.

In the Group B cycle in 2013, the ICC voting membership approved Item EB52-13, as modified by the public comment (AMPC). As part of this code change to the IEBC, a hierarchy of how the various descriptors of occupancy are referred to was set up as follows:

- Classification (A, B, E, etc.)
Group (Numbered subset within some classifications: A-1, F-2, etc.)
- Use (B animal hospital versus B post office)

Based on that change, the I-codes can now refer to a change of occupancy classification (e.g., from B to M), a change of group within the same occupancy classification (e.g., R-2 to R-1), or a change of use (e.g., A-3 exhibition hall to A-3 library). This proposal makes the language in the IgCC consistent with the change approved to the IEBC through EB52-13.

Cost Impact: Will not increase the cost of construction. This is an editorial change and does not affect how the regulations are applied.

GG303-14 : 1004.1-SIU967

GG304-14

1004.1

Proponent: Maureen Traxler, City of Seattle, representing City of Seattle
(maureen.traxler@seattle.gov)

Revise as follows:

1004.1 Change of occupancy. Where a change in occupancy of a building or tenant space places it in a different division of the same group of occupancy or in a different group of occupancies, as determined in accordance with the provisions of the *International Building Code*, compliance with Sections ~~1001.3 and 1001.4~~1003.2 shall be required.

Exception: Historic buildings in accordance with Section 1005 shall not be required to comply with Section 1004.

Reason: This proposal contains incorrect citations to Sections 1001.3 and 1001.4. Section 1004 of IgCC PV2 referenced Section 1003.2; Section 1003.2 is the comparable section in the 2012 IgCC.

Cost Impact: Will not increase the cost of construction.

GG304-14 : 1004.1-TRAXLER323

GG305-14

1005.1

Proponent: Jack Applegate, Jack Applegate Code Consulting, representing Jack Applegate Code Consulting (japplegate@astoria.or.us)

Revise as follows:

1005.1 Historic buildings. The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy, where each individual provision is evaluated separately on its own merit, shall not be mandatory for historic buildings for any of the following conditions:

1. Where implementation of such provisions would require a change in the visible configuration of building components in a manner that is not in keeping with the building's historic nature, as determined by the *code official*; or
2. Where compliance with such provisions would produce a conflict with a building function that is fundamental to the historic nature of the building.
3. Where non historic unregistered buildings have additions of decorative interior or exterior features, glazing, decorative glazing, antique or replica lighting or plumbing fixtures consistent with the buildings historic character that are added to existing structures that are located in a city, state, or National Historic District where authorized by the code official, provided:
 - a. The restored building or structure will not be more hazardous based on life safety, fire safety and sanitation than the existing building and:
 - b. The building official seeks the advice of the local, state or national historic preservation officer.

Reason: Many Building Owners in local Historic Districts are challenged with the task of slowly refurbishing historic age buildings but do not have the full resources to perform a complete renovation compliant with Local, State and National regulations to qualify for full Historic Designation.

This change would keep within the intent of the code and encourage Green practices by using existing buildings which may otherwise be left unused due to prohibitive costs of meeting all the new energy code requirements for things as simple as even window replacements.

This provision would allow the Building Officials to make exceptions for this type of Building when they have set up a short term improvement plan with the developer to work towards historic designation.

Cost Impact: Will not increase the cost of construction

GG305-14 : 1005.1-APPLEGATE913

GG306-14

1005.1, 202

Proponent: Jim Edelson, New Buildings Institute, representing New Buildings Institute; Ric Cochrane (ric_cochrane@nthp.org)

Delete and substitute as follows:

SECTION 202 DEFINITIONS

HISTORIC BUILDINGS. Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.

Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places
2. Designated as historic under an applicable state or local law; or
3. Certified as a contributing resource within a National Register listed, state designated, or locally designated historic district.

Revise as follows:

1005.1 Historic buildings. The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy, where each individual provision is evaluated separately on its own merit, shall not be mandatory for historic buildings ~~for any of the following conditions provided a report has been submitted to the code official and signed by a registered design professional, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the building.~~

1. ~~Where implementation of such provisions would require a change in the visible configuration of building components in a manner that is not in keeping with the building's historic nature, as determined by the code official; or~~
2. ~~Where compliance with such provisions would produce a conflict with a building function that is fundamental to the historic nature of the building.~~

Reason: In the 2015 cycle of the I-Codes, the definition of "historic building" has been revised in the IEBC, the IPMC, and the commercial and residential sections of the IECC. Those four codes had four inconsistent and confusing definitions for "historic building." All of the 2015 editions will have a consistent and clear definition of "historic building" that reflects how historic buildings are actually designated or determined to be eligible for listing in the US, at either the national, state or local level - and either individually or as part of a district. This proposal brings that same definition that was adopted in the IECC, IEBC and IPMC for historic buildings to the IgCC, making it consistent with the other I-Codes.

The proposal also changes the charging language for historic buildings in the IgCC. The existing charging language seeks to limit the extent to which historic buildings would be exempted from the provisions of the IgCC. It makes historic buildings subject to the current IgCC with two exemptions. However, those two exemptions require the code official to make a determination of impact on historic nature or function. Similar approaches were considered during the 2013 hearings for the 2015 edition of the IECC, but were rejected by the ICC voting body because such determinations generally do not fall under the authority of the building department, but rather national, state and local designation authorities.

This proposal parallels the approach adopted in Section C101.4.2 of the commercial section of the 2015 IECC. Historic buildings are exempt from provisions of the code when a report is provided explaining why compliance would be detrimental to the historic form, fabric or function of the building. To provide flexibility while ensuring the report's credibility, the proposal provides that can the report be signed by any of:

1. A registered design professional
2. A representative of the State Historic Preservation Office or

3. A representative of any other preservation authority having jurisdiction over the building.

This removes building officials from having to make historic determinations that are the province of other authorities. With this proposal, the IgCC also avoids giving a blanket exemption to energy savings in historic buildings, while exempting historic buildings only from those provisions that could be detrimental to the historic nature of the building.

Cost Impact: Will not increase the cost of construction

GG306-14 : 1005.1-EDELSON627

GG307-14

1005.1

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

Delete and substitute as follows:

1005.1 Historic buildings. ~~The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy, where each individual provision is evaluated separately on its own merit, shall not be mandatory for historic buildings for any of the following conditions:~~

- ~~1. Where implementation of such provisions would require a change in the visible configuration of building components in a manner that is not in keeping with the building's historic nature, as determined by the code official; or~~
- ~~2. Where compliance with such provisions would produce a conflict with a building function that is fundamental to the historic nature of the building.~~

Provisions of this code relating to the construction, repair, alteration, restoration and movement of structures, and change of occupancy shall not be mandatory for historic buildings provided a report has been submitted to the code official and signed by a registered design professional, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the building.

Reason: The intent of this proposal is to align the IgCC with the IECC's provisions regarding historic buildings. A separate but related proposal has been submitted to similarly align Section 1105 for building sites.

The intent of this section of the IgCC is to require compliance with the code, to the extent feasible, given the historic fabric and function of the building.

In the Group B cycle in 2013, the ICC voting membership approved Item CE7-13, as modified by a Public Comment (AMPC), which addressed this same issue. The public comment was put forward by a coalition of representatives of several groups, including the Washington Association of Building Officials Technical Code Development Committee and the American Institute of Architects. This proposal replaces the existing IgCC text with text identical to that approved in CE7-13. This will accomplish the same intent, as far as how the code is applied to historic buildings, and creates consistency between the codes.

One difference between the current IgCC and this proposal is there are three entities that are allowed to substantiate the determination of the impacts of the code requirements on the historic nature of the site. This provides both flexibility and reliability for the reporting requirement. As in CE7-13, the code official receives the report, but the report is created by one of the three entities listed--a registered design professional, someone from the State Historic Preservation Office, or the entity who has authority over historic preservation in the jurisdiction.

Cost Impact: Will increase the cost of construction. Possible increase in cost to procure the required report.

GG307-14 : 1005.1-SIU970

GG308-14

1006.1

Proponent: Brenda Thompson, representing SEHPCAC (SEHPCAC@iccsafe.org)

Revise as follows:

1006.1 Deconstruction and demolition material and waste management plan. Where buildings, structures or portions thereof are deconstructed or demolished, a minimum of 50 percent of materials shall be diverted from landfills. A construction material and waste management plan shall be developed that is in accordance with Section 503.1, that includes procedures for deconstruction, and that documents the total materials in buildings, structures and portions thereof to be deconstructed or demolished and the materials to be diverted.

Exceptions:

1. Where the scope of work is not adequate to feasibly separate materials
2. Where recycling facilities do not exist within 75 miles of a facility

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Exception 1 - Some projects are so small there is not financially feasible way to recycle.

Exception 2 - Portions of the country have no recycling service and at some point the cost in fuel to transport demolished materials offsets that cost of landfill impact.

This proposal is a companion to the SEHPCAC proposal 5-1 (From AHHC).

Cost Impact: Will not increase the cost of construction. Costs will be reduced for building sites which qualify for the exceptions.

GG308-14 : 1006.1-THOMPSON1081

GG309-14

1007.2

Proponent: Maureen Traxler, City of Seattle, representing City of Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

Delete without substitution:

~~**1007.2 Evaluation and certification of existing buildings and building sites.** Where a permit application is accepted by a jurisdiction for the evaluation of an existing building and building site in accordance with the requirements of this code as applicable to a new project, and this code does not otherwise require compliance, evaluation shall be in accordance with the requirements of this section.~~

Reason: We are proposing to delete Section 1007.2 because it is difficult to understand, and seems unnecessary. It reads like scoping language but Section 1007 is scoped in Section 1007.1--buildings are required to be evaluated according to Section 1007.2 when the jurisdiction chooses in Chapter 3 to make such evaluations mandatory.

There are several confusing things in the current language. It requires an evaluation according to Section 1007.2 when there is a building permit application for evaluation of an existing building according to the requirements of this code for new construction, and this code doesn't otherwise require compliance. First, evaluating a building doesn't require a permit. Second, it isn't clear what is it that the code doesn't require compliance with.

Cost Impact: Will not increase the cost of construction

GG309-14 : 1007.2-TRAXLER325

GG310-14

1007.2.2

Proponent: Maureen Traxler, City of Seattle, representing City of Seattle
(maureen.traxler@seattle.gov)

Revise as follows:

1007.2.2 Specific exclusions. ~~Where evidence of compliance is not available~~ Existing buildings evaluated under Section 1007.2 ~~shall~~ are not be subject to the following requirements:

1. of Section 806.
2. Provisions of this code related to the project's construction phase, including Sections 401.2, 406.1, 406.2, 502, 503.1 and 803.1, those portions of Section 405 related to the construction phase, and other sections as *approved* by the *code official*, ~~shall not be required for buildings evaluated under Section 1007.2.~~

~~Where buildings do not comply with the aforementioned sections,~~ The certification shall specifically list ~~the any~~ sections for which compliance has not been required or verified.

Reason: This proposal revises the existing text of this section in order to make it easier to understand. "Where evidence of compliance is not available" is deleted because of its circular logic. It seems to say that buildings aren't required to comply if they can't show that they comply.

Cost Impact: Will not increase the cost of construction

GG310-14 : 1007.2.2-TRAXLER324

GG311-14

Table 302.1, 1007.3, 1007.3.3, 1007.3.3.1, 1007.3.3.2, 1007.3.3.3

Proponent: Brenda Thompson, Chair, SEHPCAC, representing ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC)

Revise as follows:

1007.3 Post certificate of occupancy zEPI annual net energy use, energy demand, and CO₂e emissions reporting. Where the jurisdiction indicates in Table 302.1 that ongoing post certificate of occupancy zEPI annual net energy use, energy demand and CO₂e emissions reporting is required, and where the jurisdiction has indicated in Table 302.1 that enhanced energy performance in accordance with Section 302.1 ~~or CO₂e emissions in accordance with Section 602.2 are~~ is required, zEPI annual net energy use, energy demand, and CO₂e emissions reporting shall be provided in accordance with this section.

Delete and substitute as follows:

~~**1007.3.3 Reporting.** Reports in accordance with Sections 1007.3.3.1 through 1007.3.3.3 shall be generated.~~

1007.3.3 Reporting. The construction documents shall include procedures for the building owner to enter the building annual net energy consumption data from Section 603 into an approved tracking program to track building performance. For building parameters including, but not limited to number of occupants, hours of operation and number of computers, use actual average values.

The tracking program output, including annual energy use and CO₂e emissions, shall be reported by the building owner or the building owner's authorized agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its energy and CO₂e emissions reported separately. Where there are energy uses associated with the building's site other than the buildings on the site, the site energy and CO₂e emissions reports shall be reported separately. The report shall be based upon the energy use of the previous year and shall be reported on, or before, March 1st of the following year.

Delete without substitution:

~~**1007.3.3.1 Annual net energy use.** The zEPI associated with the operation of the building and the buildings on the site, as determined in accordance with Section 602.1, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION]. Where there are multiple buildings on a building site, each building shall have its zEPI reported separately.~~

~~Where there are energy uses associated with the building site other than the buildings on the site, the zEPI for the building site shall be reported separately.~~

~~Energy use for the previous year shall cover the complete calendar year and be reported~~

1007.3.3.2 Peak monthly energy demand reporting. The peak demand of all energy forms serving each building and the building site shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

~~Where there are multiple buildings on a building site, each building shall have its energy demand reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the energy demand for the building site shall be reported separately. Monthly energy demand data for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.~~

~~**1007.3.3.3 Annual CO₂e emissions reporting.** The annual emissions associated with the operation of the building and its systems, as determined in accordance with Section 602.2, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION]. Where there are multiple buildings on a building site, each building shall have its annual emissions reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the annual CO₂e emissions for the building site shall be reported separately. Emissions reported for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.~~

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Chapter 10. Existing Buildings			
1007.3	Post Certificate of Occupancy zEPI <u>annual net energy use</u> , energy demand, and CO ₂ e Emissions Reduction	Yes	No

(Portions of table not shown remain unchanged)

Reason: The current energy reporting method does not provide a method for reporting building energy use. Current reporting requires annual energy consumption in the zEPI format. But the current code language is unclear on how to do the measurement and reporting. The current zEPI figure is a ratio of two energy models. Each model is a design-phase estimate of the building energy use: the baseline, code-minimum building vs the design building. Chapter 10 does not include a methodology to input the actual energy use of the building (electricity, gas and other fuels) into the zEPI calculation. As written, Section 1007.3.3.1 would have the same result every year: the figure would be the design phase zEPI, not a zEPI that reports the current year energy use.

The SEHPCAC has proposed clarification and simplification of annual energy use reporting. This proposal requires that whenever a jurisdiction adopts the post-occupancy reporting portion of the IgCC, reporting of annual energy use and emissions shall be via the reporting program selected by the local jurisdiction. To require post-occupancy energy use reporting, most jurisdictions have needed to pass local regulations/ordinances in order to gain the authority to require reporting. Most of the jurisdictions that passed ordinances (New York City, Chicago, Boston, Seattle, San Francisco, and others) selected the US EPA's Energy Star Portfolio Manager program. The USGBC's LEED program and ASHRAE 189.1 also require the use of Portfolio Manager for post-occupancy energy reporting. Portfolio Manager returns integrated site- and source-energy use, as well as CO₂e reporting.

Portfolio Manager is expected to be the most required reporting method. However, some jurisdictions have locally-developed energy reporting programs (Austin, TX). So this proposal defaults to the locally-selected reporting program. Given the complex regulatory issues surrounding energy use reporting, most locations that currently require post-occupancy reporting have had to adopt regulation beyond their building codes.

Therefore, since a jurisdiction will adopt a reporting program when they adopt any energy reporting regulation (outside of building codes), defaulting to the local reporting requirement selected by the jurisdiction should be included in the IgCC. There is no need for the IgCC to create a reporting methodology within this code that might conflict with locally adopted reporting ordinances. The cities and states that currently rely on Portfolio Manager would be less likely to consider the IgCC for adoption without this flexibility to select their own reporting method.

Section 1007.3.3 has been further simplified to combine 1007.3.3.1 through 1007.3.3.3 into a single paragraph. This deletes redundancy of reporting requirements.

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

GG311-14 : 1007.3.3.1-THOMPSON745

GG312-14

1007.4 (New)

Proponent: David Collins, The Preview Group, Inc., representing American Institute of Architects (dcollins@preview-group.com)

Add new text as follows:

1007.4 Post occupancy mechanical system re-commissioning. The commissioning activities specified for mechanical systems in Sections 611.1.2 through 611.1.3 shall be repeated 18 to 24 months after certificate of occupancy. Systems and control devices that are not functioning properly shall be repaired or replaced. Adjustments to calibration settings shall be documented. This documentation shall be provided to the building owner.

Reason: As soon as a new building is completed and occupied it becomes an “existing building”. The intent of the existing building provisions in the IgCC is that the sustained performance of the building be in accordance with the building’s design and anticipated operation. This proposed revision will further that goal by requiring post-occupancy re-commissioning of buildings after they have been occupied and in use for 18-24 months.

The items noted in the pre-occupancy commissioning criteria for mechanical equipment are susceptible to changes over time due to equipment malfunction or operational changes made by the building users as they learn how to use the building. By requiring that the building be “tuned up” based on the original equipment commissioning criteria after it has been “broken in” this proposal would result in improved building efficiency and provide for improved occupant comfort as well.

Cost Impact: Will not increase the cost of construction

GG312-14 : 1007.4 (NEW) #1-COLLINS395

GG313-14

1007.4 (New), 1007.4.1 (New), 1007.4.2 (New)

Proponent: David Collins, The Preview Group, Inc., representing American Institute of Architects (dcollins@preview-group.com)

Add new text as follows:

1007.4 Sale of existing buildings and portions of buildings. Buildings or portions of buildings that are sold shall comply with Sections 1001.5, 1001.6 and 1001.7 within 1 year of sale.

1007.4.1 Responsibility for compliance. The buyer and seller shall share responsibility for compliance. Allocation of responsibility for compliance shall be by agreement between buyer and seller. Upon completion of the work the responsible party shall file a notice of compliance with the jurisdiction.

1007.4.2 Certificate of non-compliance. If the building is not in compliance with this section at the end of the compliance period the jurisdiction shall file in the office of the recorder, a certificate describing the property and certifying that the building is not in compliance with this section and that the owner has been so notified at least 14 days prior. If the building is brought into compliance with this section, the jurisdiction shall, within 14 days, file a new certificate with the county recorder certifying that the building is in compliance with this section.

Reason: The intent of the existing building provisions in the IgCC should require that any work done on an existing building, or any major change to the building's condition, results in an incremental improvement in the sustainable performance of the building. This proposed revision will further that goal for buildings which are sold.

This proposal assumes that additional basic requirements will be added to Section 1001 which are to be triggered by any permitted work. This proposal extends the requirement to make those basic improvements upon the sale of the building.

The additional requirements proposed in another code change for Section 1001 add a set of readily undertaken improvements to existing buildings. These relatively simple and low-cost measures will result in improved building performance for existing buildings. The requirements are simple and rational and will yield measurable building performance improvements for minimal investment. The measures could readily be done at the time of building sale. The measures basically involve repairing deferred maintenance items like broken thermostats, replacing filters and verifying that ducts are sealed. The work could be done at a time when the original owner is moving out and the new owner moving in. Even if the building sale resulted in only a change of ownership, without a change of occupant, as in tenancy situations, the work can be readily done with minimal interruption to occupants. The required work would result in improved building efficiency and very likely provide for improved occupant comfort as well.

Cost Impact: Will not increase the cost of construction

GG313-14 : 1007.4 (NEW) #2-COLLINS759

GG314-14

Table 302.1, 1007.4 (New)

Proponent: Jim Edelson, New Buildings Institute, representing New Buildings Institute

Add new text as follows:

1007.4 Post occupancy minimum energy performance. Where the jurisdiction indicates in Table 302.1 that post occupancy minimum energy performance is required, buildings of the occupancies listed in Table 302.1 shall be maintained and operated to achieve a source energy use index (EUI) less than or equal to the value from Table 302.1 based on the occupancy . Where a building has multiple occupancies from Table 302.1, the maximum allowable energy use shall be based on the total gross floor area of each occupancy in relation to the total gross floor area of all occupancies within the building. The source energy use index (EUI) shall cover the complete calendar year and include energy consumed by the building and building site from all forms of energy defined in Sections 603.3.1 through 603.3.6, converted to source Btus in accordance with Sections 602.1.2.2 and 602.1.2.3, and shall be reported on, or before, March 1 of the following year.

Revise as follows:

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	Yes	No
1007.3	Post Certificate of Occupancy zEPI, energy demand, and CO ₂ e	Yes	No
1007.4	<u>Post Certificate of Occupancy Minimum Energy Performance - The jurisdiction shall indicate a source EUI in each occupancy for which it intends to require Post Certificate of Occupancy Minimum Energy Performance.</u>	<u>Occupancy: ___ EUI: ___</u>	

(Portions of table not shown remain unchanged.)

Reason: According to the Urban Land Institute, New Construction and Major Renovations impact only 1-2% of the building stock in a typical year. For the larger population of existing buildings, building codes' primary means of improving energy efficiency are through alterations. However, as current codes are formulated, the scope of that impact is generally limited to the scope of the alteration. Code requirements generally apply only to the alterations and not to the energy efficiency of the whole building. This highlights the inability of a jurisdiction's energy code to improve the energy efficiency of its whole building stock.

With its existing buildings chapter and jurisdictional electives, the IgCC provides a unique opportunity to move beyond the limitations of traditional codes. This proposal adds an additional jurisdictional elective that would allow a jurisdiction to set a performance "floor," a minimum performance threshold, for its building stock. This would allow a jurisdiction to make egregious inefficiency a code violation, subject to the standard violation mechanisms already used by jurisdictions. Setting aspirational targets can be complicated because the targets must account for usage variables such as occupancy schedule, occupancy density, etc. However, setting a threshold for the "floor" does not suffer this problem, because it is a level of performance that no building, regardless of how it is being used, should fall below.

Setting a minimum performance threshold is not appropriate for every jurisdiction since not every jurisdiction has the authority or the will to do so. Therefore, this proposal utilizes the jurisdictional electives so that it will only apply to those jurisdictions that desire such a provision and can enforce it. Following the precedent of the "zEPI of jurisdictional choice" the actual EUI threshold is left for the jurisdiction to apply, so that the threshold is appropriate for that jurisdiction's building stock and truly represents the very worst performing buildings.

This jurisdictional elective will give the IgCC that national leadership for jurisdictions looking for ways to have their entire building stock contribute to policy goals, not just the new buildings.

Cost Impact: Will not increase the cost of construction

GG314-14 : 1007.4 (NEW) -EDELSON1044

GG 315-14
1101

Proponent: Craig Conner, self, representing self (craig.conner@mac.com)

Delete without substitution:

SECTION 1101
GENERAL

SECTION 1102
ADDITIONS

SECTION 1103
~~ALTERATIONS TO EXISTING BUILDING SITES~~

SECTION 1104
~~CHANGE OF OCCUPANCY~~

SECTION 1105
~~HISTORIC BUILDING SITES~~

Reason: The section on existing sites is not useful and unduly complicates the code.

Cost Impact: Will not increase the cost of construction.

GG 315-14 : CHAPTER 11-CONNER1208

GG316-14

1101.4.1

Proponent: Richard Miller, representing IAFC FLSS (rmiller@iafc.org)

Revise as follows:

1101.4.1 Existing materials, assemblies, configurations and systems. Materials and systems already in use on a building site in compliance with the requirements or approvals in effect at the time of their installation shall be permitted to remain in use ~~unless determined by the code official to be dangerous to the environment, life, health or safety. Where such conditions are determined to be dangerous to the environment, life, health or safety, they shall be mitigated or made safe.~~

Existing buildings and site improvements located within or located closer to protected areas than permitted by Section 402.1 but that are in compliance with the requirements or approvals in effect at the time of their installation shall be permitted to remain in use unless determined by the *code official* to be dangerous to the environment, life, health and safety of the community and the occupants of the building site. Where such conditions are determined to be dangerous to the environment, life, health or safety, they shall be mitigated or made safe.

Reason: This existing language sets up a direct conflict with the scope, intent and applicability of the IFC due to a lack of determination, clarity or guidance on the code official's perspective of what may constitute a danger to life, safety or health.
"This proposal is approval by the Fire-CAC, but not reviewed by SEHP-CAC"

Cost Impact: Will not increase the cost of construction.

GG316-14 : 1101.4.1-MILLER551

GG317-14

1101.4.1, 1101.4.2

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

1101.4.1 Existing materials, assemblies, configurations and systems. Materials and systems already in use on a building site in compliance with the requirements or approvals in effect at the time of their installation shall be permitted to remain in use unless determined by the *code official* to be unsafe or dangerous to the environment, life, health or safety. Where such conditions are determined to be unsafe or dangerous to the environment, life, health or safety unsafe, they shall be mitigated or made safe.

Existing buildings and site improvements located within or located closer to protected areas than permitted by Section 402.1 but that are in compliance with the requirements or approvals in effect at the time of their installation shall be permitted to remain in use unless determined by the *code official* to be unsafe or dangerous to the environment, life, health and safety of the community and the occupants of the building site. Where such conditions are determined to be unsafe or dangerous to the environment, life, health or safety, they shall be mitigated or made safe.

1101.4.2 New and replacement materials, assemblies, configurations and systems. Except as otherwise required or permitted by this code, materials, assemblies, configurations and systems permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs and alterations provided no hazard to ~~the environment~~, life, health or property is created. Hazardous materials shall not be used where the code for new construction would not permit their use at building sites of similar occupancy, purpose and location.

Reason: The proposed change resolves a conflict between Sec. 1104.4. and Sec. 102.6, Existing Structures, which states that, *“The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the International Building Code, the International Existing Building Code, the International Property Maintenance Code or the International Fire Code, or as is deemed necessary by the code official for the general safety and welfare of building occupants and the public.”*

The current language of Sec. 1101.4.1 lacks the specificity necessary to correlate with Sec. 102.6.; it gives far too much authority to the code official without providing any guidance on how to use that authority. How is a local code official to decide exactly what *“dangerous to the environment”* means? Could a code official order the replacement of a dark colored roof covering with a roof covering with better solar reflectance and thermal emittance on the basis of the darker roof being dangerous to the environment because of its increased contribution to global warming? Could a code official order removal of a windmill or turbine for being dangerous to the environment because of its hazard to birds? Could a code official order the removal of all landscaping that was not xeriscaped?

Sec 1104.1.4.2 is similarly murky. Every material is potentially hazardous to some aspect of the environment. The code should specifically identify materials that are not to be used if there is a concern with those materials.

The code cannot tolerate such subjectivity. The IEBC provides definitions of *“dangerous”* and *“unsafe.”* It is appropriate to refer to the IEBC for those definitions when a code official is considering ordering mitigation of existing conditions.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GG317-14 : 1101.4.1-THOMPSON741

GG318-14

1103.2

Proponent: Barry Greive, Target Corporation, representing Target Corporation
(barry.greive@target.com)

Revise as follows:

1103.2 Changes to hardscapes and surface vehicle parking. Where existing hardscapes are altered, the alterations shall comply with the provisions of this code.

Exceptions:

1. Existing hardscapes and vegetation are permitted to be replaced with materials shown in previously *approved* construction documents.
2. Where existing vehicle surface parking lots are altered without changing parking space configuration or increasing the number of parking spaces, the altered parking lot shall not be required to comply with Section 407.4.
3. Alterations to accessible parking spaces shall not be required to comply with Section 407.4.

Reason: For many businesses and also as a jurisdictional requirement if there is a restriping project happening the accessible parking spaces are many times upgraded to meet the new regulations for size and aisle widths, this can change the parking layout and sometimes involves losing a space or two. An owner should not be penalized for making an upgrade for accessibility purposes.

Cost Impact: Will not increase the cost of construction.

GG318-14 : 1103.2-GREIVE1124

GG319-14

1105.1

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

Delete and substitute as follows:

1105.1 Historic building sites. ~~The provisions of this code relating to the construction, repair, alteration, addition and restoration of building sites and site improvements, where each individual provision is evaluated separately on its own merit, shall not be mandatory for historic building sites for any of the following conditions:~~

- ~~1. Where implementation of that provision would change the visible configuration of building site improvements in a manner that is not in keeping with the building site's historic nature, as determined by the *code official*, in consultation with the authority having jurisdiction over historic buildings or sites;~~
- ~~2. Where compliance with that provision would produce a conflict with a building site function that is fundamental to the historic nature of the building site, as determined by the *code official*, in consultation with the authority having jurisdiction over historic buildings or sites; or~~
- ~~3. Where such building sites are judged by the *code official* in consultation with the authority having jurisdiction over historic buildings or sites to not constitute a distinct environmental hazard.~~

Provisions of this code relating to the construction, repair, alteration, addition and restoration of building sites and site improvements shall not be mandatory for historic building sites, provided a report has been submitted to the code official and signed by a *registered design professional*, or a representative of the State Historic Preservation Office, or the historic preservation authority having jurisdiction, demonstrating compliance with that provision would threaten, degrade or destroy the historic nature of the building site. This section shall not apply where the authority having jurisdiction for environmental safety determines the building site constitutes a distinct environmental hazard.

Reason: The intent of this proposal is to align the IgCC with the IECC's provisions regarding historic buildings. A separate but related proposal has been submitted to similarly align Section 1005.

The intent of this section of the IgCC is to require compliance with the code, to the extent feasible, given the historic nature of the building site. The only consideration that could override the needs of historic preservation is if the site is a "distinct environmental hazard."

In the Group B cycle in 2013, the ICC voting membership approved Item CE7-13, as modified by a Public Comment (AMPC), which addressed this same issue. The public comment was put forward by a coalition of representatives of several groups, including the Washington Association of Building Officials Technical Code Development Committee and the American Institute of Architects. This proposal replaces the existing IgCC text with text similar to that approved in CE7-13. This will accomplish the same intent, as far as how the code is applied to historic building sites, and creates consistency between the codes.

One difference between the current IgCC and this proposal is there are three entities that are allowed to substantiate the determination of the impacts of the code requirements on the historic nature of the site. This provides both flexibility and reliability for the reporting requirement. As in CE7-13, the code official receives the report, but the report is created by one of the three entities listed—a registered design professional, someone from the State Historic Preservation Office, or the entity who has authority over historic preservation in the jurisdiction.

In addition, it is likely that another entity, such as the Federal Environmental Protection Agency, will be the agency with the expertise to determine whether the site is a "distinct environment hazard"—it is much less likely that expertise will reside in the code official's office or in that of the historical preservation authority. However, if the code official does have the authority and expertise, the proposed text is broad enough to allow them to make the determination.

Cost Impact: Will increase the cost of construction. Possible extra cost to procure the required report.

GG319-14 : 1105.1-SIU1015

GG 320-14

Appendix A (New)

Proponent: Craig Conner, self, representing self (craig.conner@mac.com); Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Hope Medina, representing self (HMedina@coloradocode.net); Terry Cobb, Director of Development Services, Metropolitan Nashville & Davidson County, TN, representing self (terry.cobb@nashville.gov)

Add new text as follows:

APPENDIX A **ALTERNATIVE IgCC**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance. This appendix is intended to be a standalone green code to be used as an overlay to the International Codes as an alternative to the requirements of Chapters 1 through 12 of this code.

SECTION A100 **SCOPE AND ADMINISTRATION**

PART 1—SCOPE AND APPLICATION

SECTION A101 **GENERAL**

A101.1 Title. These regulations shall be known as the Green Construction Code of [NAME OF JURISDICTION] hereinafter referred to as “this code.”

A101.2 General. This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction. This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code.

A101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of buildings or structures or appurtenances connected or attached to such buildings or structures. Occupancy classifications shall be determined in accordance with the International Building Code[®] (IBC[®]).

Exceptions:

1. Equipment or systems used primarily for industrial processes or manufacturing.
2. Temporary structures approved under Section 3103 of the *International Building Code*.
3. Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.

A101.3.1 Alternate compliance. Compliance with ASHRAE 189.1 shall be an alternative to compliance with the provisions of this code.

A101.4 Other provisions of this code. Chapters and provisions of this code other than this appendix shall not apply unless specifically adopted.

A101.5 Intent. This code is intended to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. This code is not intended to abridge or supersede safety, health or environmental requirements under other codes or ordinances.

SECTION A102 **APPLICABILITY**

A102.1 Code conflicts. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

A102.2 Other laws. The provisions of this code shall not nullify the provisions of local, state or federal law.

A102.3 Application of references. References to section numbers, or to provisions not specifically identified by number, shall be construed to refer to such sections or provisions of this code.

A102.4 Referenced codes and standards. The following codes shall be considered part of the requirements of this code: *the International Building Code® (IBC®), the International Code Council Performance Code® (ICCPC®), the International Energy Conservation Code® (IECC®), the International Existing Building Code® (IEBC®), the International Fire Code® (IFC®), the International Fuel Gas Code® (IFGC®), the International Mechanical Code® (IMC®), the International Plumbing Code® (IPC®), International Property Maintenance Code® (IPMC®), and the International Residential Code® (IRC®).*

A102.4.1 Conflicting provisions. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code or the International Codes listed in Section A102.4, the provisions of this code or the International Codes listed in Section A102.4 shall take precedence over the provisions in the referenced code or standard.

A102.5 Partial invalidity. In the event that a part or provision of this code is held to be illegal or void, this shall not have the effect of making other parts or provisions of this code void or illegal.

A102.6 Existing structures. The legal occupancy of a structure existing on the date of adoption of this code shall continue without change, except as is specifically covered in this code, the *International Building Code*, the *International Existing Building Code*, the *International Property Maintenance Code* or the *International Fire Code*, or as is deemed necessary by the code official for the general safety and welfare of building occupants and the public.

A102.7 Mixed occupancy buildings. In mixed occupancy buildings, each portion of a building shall comply with the specific requirements of this code applicable to each specific occupancy.

PART 2 – ADMINISTRATION AND ENFORCEMENT

SECTION A103 **DUTIES AND POWERS OF THE CODE OFFICIAL**

A103.1 General. The code official established in the *International Building Code* is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions and how this code relates to other applicable codes and ordinances. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code and other applicable codes and ordinances. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code or other applicable codes and ordinances.

A103.2 Applications and permits. The code official shall enforce compliance with the provisions of this code as part of the enforcement of other applicable codes and regulations, including the referenced codes listed in Section A102.4.

A103.3 Notices and orders. The code official shall issue all necessary notices or orders to ensure compliance with this code.

A103.4 Inspections. The code official shall make inspections, as required, to determine code compliance, or the code official shall have the authority to accept reports of inspection by approved agencies or individuals. The code official is authorized to engage such expert opinion as deemed necessary to report on unusual technical issues that arise, subject to the approval of the appointing authority.

SECTION A104 **CONSTRUCTION DOCUMENTS**

A104.1 Information on construction documents. The content and format of construction documents shall comply with the International *Building Code*.

SECTION A105 **APPROVAL**

A105.1 General. This code is not intended to prevent the use of any material, method of construction, design, system, or innovative approach not specifically prescribed herein, provided that such construction, design, system or innovative approach has been approved by the code official as meeting the intent of this code and all other applicable laws, codes and ordinances.

A105.2 Approved materials and equipment. Materials, equipment, devices and innovative approaches approved by the code official shall be constructed, installed and maintained in accordance with such approval.

A105.2.1 Used materials, products and equipment. Used materials, products and equipment shall meet the requirements of this code for new materials. The reuse of used equipment and devices shall be subject to the approval of the code official.

A105.3 Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases, upon application of the owner or owner's representative, provided the code official shall first find that special individual reason makes the strict letter of this code impractical and that the modification is in compliance with the intent and purpose of this code and that such modification does not lessen the minimum requirements of this code. The details of granting modifications shall be recorded and entered in the files of the department.

A105.4 Alternative materials and methods. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design, innovative approach, or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design, innovative approach or method of construction shall be reviewed and approved where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, design, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code. The details of granting the use of alternative materials, designs, innovative approach and methods of construction shall be recorded and entered in the files of the department.

A105.4.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

A105.4.2 Tests. Wherever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the code official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the code official for the period required for retention of public records.

A105.5 Compliance materials. The code official shall have the authority to approve specific

computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

A105.6 Approved programs. The code official or other authority having jurisdiction shall have the authority to deem a national, state or local program to meet or exceed this code. Buildings approved in writing by such a program shall be considered to be in compliance with this code.

A105.6.1 Specific approval. The code official shall have the authority to approve programs or compliance tools for a specified application, limited scope or specific locale. For example, a specific approval shall be permitted to apply to a specific section or chapter of this code.

SECTION A106 **PERMITS**

A106.1 Required. An owner or owner's authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any energy, electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the code official and obtain the required permit under the applicable code or regulation relevant to the intended work. Separate permits shall not be issued under this code. Exemptions from permit requirements shall not be deemed to grant authorization for work to be done in any manner in violation of the provisions of this code or other laws, codes or ordinances of this jurisdiction.

SECTION A107 **FEES**

A107.1 Fees. Fees for permits shall be paid as required, in accordance with the schedule as established by the applicable governing authority for the intended work prescribed in an application.

SECTION A108 **BOARD OF APPEALS**

A108.1 General. Appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code shall be made to the Board of Appeals created under the applicable International Code®.

A108.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted there under have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall have no authority to waive requirements of this code.

A108.3 Qualifications. The members of the board of appeals related to interpretation of this code shall be qualified by experience and training in the matters covered by this code and shall not be employees of the jurisdiction.

SECTION A109 **CERTIFICATE OF OCCUPANCY**

A109.1 Violations. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction.

SECTION A200 **DEFINITIONS**

SECTION A201 GENERAL

A201.1 Scope. Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this section.

A201.2 Interchangeability. Words used in the present tense shall include the future; words stated in the masculine gender shall include the feminine and neuter; the singular number shall include the plural and the plural, the singular.

A201.3 Terms defined in other codes. *International Energy Conservation Code. (IECC.), International Fire Code. (IFC.), International Fuel Gas Code. (IFGC.), International Mechanical Code. (IMC.), International Plumbing Code. (IPC.) or International Residential Code. (IRC.),* such terms shall have the meanings ascribed to them as in those codes.

A201.4 Terms not defined. Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

SECTION A202 **DEFINITIONS**

ENVIRONMENTAL PRODUCT DECLARATION. A report for a product or material based on a product's life cycle and other information relevant to its environmental impact.

RENEWABLE ENERGY CREDIT. The property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. A renewable energy credit is sold separately from the electricity associated with a renewable energy source.

PREFERRED PLANT SPECIES. Species of trees, grasses, shrubs and other plants that are recognized by the jurisdiction as being preferred for use, or a specific use, within the jurisdiction based on considerations such as water use, drought tolerance, fire, shade, cooling effect and usefulness in specific applications. The species shall be native species, adapted species, or species that are otherwise judged beneficial by a jurisdiction.

SECTION A300 **SITE DEVELOPMENT AND LAND USE**

SECTION A301 **GENERAL**

A301.1 Scope and intent. This section provides requirements for the development and maintenance of buildings and building sites to minimize negative environmental impacts and to protect, restore and enhance the natural features and environmental quality of the site.

SECTION A302 **PRESERVATION OF NATURAL RESOURCES**

A302.1 Protected areas. Agricultural lands, flood hazard areas, conservation areas, greenfields, brownfields, sites adjacent to surface water bodies and wetlands. Construction documents shall show the location of the protected areas on, or adjacent to the building site. Construction documents shall show the required buffer zones around protected areas.

A302.2 Vegetation and soil protection. *Construction documents* shall identify existing vegetation and soils located on a *building site* that are to be preserved and protected. Protected areas and plants with undisturbed soils shall be provided with a physical barrier, such as temporary fencing or other physical barrier. Perimeters around trees shall be identified as a circle with a radius of not less than 1 foot (305 mm) for every inch (25.4 mm) of tree diameter, with a minimum radius of 5 feet (1524 mm). Perimeters around shrubs shall be not less than twice the radius of the shrub.

Exception: *Approved* alternative perimeters appropriate to the location and the species of the trees and shrubs shall not be prohibited.

A302.3 Topsoil protection. *Topsoil* that potentially could be damaged by construction activities or equipment shall be removed from areas to be disturbed and stockpiled for future reuse on the *building site* or other *approved* location. *Topsoil stockpiles* shall be protected throughout the project with soil stabilization measures to prevent erosion or compaction.

A302.4 Soil reuse and restoration. Soils that are being placed or replaced on a *building site shall be prepared, amended and placed in a manner that establishes or restores the ability of the soil to support the vegetation that has been protected and that will be planted.*

A302.5 Pervious and permeable pavement. Pervious and permeable pavements including open grid paving systems and open-graded aggregate systems shall not be prohibited where these *hardscapes do not interfere with fire and emergency apparatus or vehicle or personnel access and egress, utilities, or telecommunications lines. Aggregate used in the base shall be of uniform size. The percolation rate of the pavement and the base shall not be less than 1.25 gallons per hour per square foot (100 L/min x m²).*

A302.6 Stormwater. Stormwater management for the *building site or complex of building sites within the development* shall address the potential increase in runoff that would occur resulting from construction and shall either:

1. Manage rainfall on-site to retain, use or infiltrate at a minimum, the volume of a single storm which is equal to the 95th percentile rainfall event, or
2. Improve, maintain or restore the pre-development stable, runoff hydrology of the site in an approved manner. Runoff rate and volume shall not exceed predevelopment rates.

A302.6.1 Rainwater catchment. Where allowed by the jurisdiction, rainwater catchment shall be permitted to be used as part of stormwater management.

A302.6.2 Site infiltration. Infiltration into the site or development shall not be required to be used as part of stormwater management. Site infiltration shall include drainage of impermeable surfaces onto vegetated areas or permeable hardscapes.

A302.6.3 Adjoining lots. The stormwater management system shall not cause increased erosion or other drainage related damage to adjoining lots or public property.

A302.7 Plant selection. Plants selected for use on the building site shall comply with the following:

1. To the extent defined by the jurisdiction, preferred plant species shall be used in accordance with the guidelines established by the jurisdiction.
2. Invasive plant species, as defined by the jurisdiction, shall not be permitted. Existing invasive plant species on the site shall be contained or removed based on either the jurisdiction's recommendations or guidance by a qualified professional.

SECTION A303 **BUILDING SITE WASTE MANAGEMENT.**

A303.1 Building site waste management. Land-clearing debris shall be reused or otherwise diverted from landfills and other forms of disposal. Land-clearing debris includes rock, trees, stumps and associated vegetation. Storage of site waste shall be in compliance with the combustible waste material requirements of Section 304 of the *International Fire Code.*

Exception: Compliance with Section 303 shall not be required where it is in conflict with jurisdictional, state or Federal regulation; or where deemed impractical by the code official.

SECTION A304 **BICYCLES**

A304.1 Walkways and bicycle paths. Walkways and bicycle paths shall connect to existing paths or sidewalks, and shall be designed to connect to planned future paths. Walkways and bicycle paths shall be designed to support stormwater management. Walkways and bicycle paths shall not interfere with fire and emergency apparatus, vehicle or personnel access.

A304.2 Bicycle parking. Bicycle parking shall comply with Sections A304.2.1 through A304.2.3.
A304.2.1 Number of spaces. The minimum number of bicycle parking spaces shall be one per hundred occupant load, and not less than four bicycle parking spaces shall be provided. Occupant load shall be determined based upon Section 1004 of the International Building Code. Accessory occupancy areas shall be included in the calculation of primary occupancy area.

Exceptions:

1. Bicycle parking shall not be required where the conditioned space is less than 2,000 square feet (232 m2).
2. Subject to the approval of the code official, the number of bicycle parking spaces shall be permitted to be reduced due to building site characteristics including, but not limited to, isolation from other development.
3. Bicycle parking shall not be required for Group R occupancies.

Combining bicycle parking spaces for multiple buildings shall not be prohibited, provided that the spaces are sufficient for the combined occupant load of the buildings.

A304.2.2 Description of spaces. Bicycle parking spaces shall comply with the following:

1. Shall have an area of not less than 18 inches (457 mm) by 60 inches (1524 mm) per bicycle;
2. Shall be provided with a rack or other facility for locking or securing each bicycle.

A304.2.3 Location of spaces. The location of bicycle parking shall be designated on the site plan. Bicycle parking shall comply with the following:

1. Bicycle parking spaces shall be located indoors or outdoors within 100 feet of the main entrance to the building.
2. Bicycle parking spaces shall be located at the same grade as the sidewalk, or at a location accessed by a ramp or an accessible route.
3. Bicycle parking spaces shall be visible from the main entrance to the building or directional signage shall be provided at the main entrance indicating the location of such parking spaces.
4. Bicycle parking spaces shall not occupy vehicle parking spaces required by local zoning ordinances and those accessible parking spaces required by the International Building Code.

SECTION A400
MATERIAL RESOURCE CONSERVATION AND EFFICIENCY

SECTION A401
GENERAL

A401.1 Scope. The provisions of this section shall govern matters related to building material conservation, resource efficiency and environmental performance.

SECTION A402
CONSTRUCTION WASTE MANAGEMENT

A402.1 Waste amount. Construction waste shall meet one of the following criteria for non-hazardous waste:

1. Construction waste sent to disposal shall not exceed 3 lb/square foot of gross floor area. The materials sent to disposal shall be documented.
2. Not less than fifty percent of the waste shall be diverted from disposal by reuse, recycle, salvage or sale. The fifty percent shall be determined by weight or volume, but not both. Both the materials diverted from disposal and the materials sent to disposal shall be documented.

A402.1.1 Waste management plan. A plan for reuse, recycle, salvage, donation or sale by type of

materials shall be included with construction documents. The *approved* plan shall include the intended disposition of construction waste materials. Waste materials shall be sorted on site or stored on site for sorting at another location.

A402.1.2 Waste not covered. For the purpose of this section, construction and waste materials shall not include land clearing debris, excavated soils and fill and base materials such as, but not limited to, *topsoil*, sand and gravel. Hazardous waste shall be handled in accordance with laws, rules and ordinances applicable in the jurisdiction.

A402.1.3 Waste storage. Storage of construction waste shall be in compliance with the combustible waste material requirements of Section 304 of the International *Fire Code*.

A402.1.4 Hazardous waste. Hazardous waste shall be handled in accordance with laws, rules and ordinances applicable in the *jurisdiction*.

SECTION A403 **BUILDING MATERIAL AND PRODUCT ENVIRONMENTAL DECLARATION**

A403.1 Building material and product environmental declaration. Not less than 10 different permanently installed materials or products shall include an *Environmental Product Declaration*. The *Environmental Product Declaration* shall be based on externally verified data. The *Environmental Product Declaration* shall be certified by an *approved agency* or third party in accordance with CAN/CSA-ISO 14025 and ISO 21930.

Exception: Buildings with an area of less than 10,000 square feet.

SECTION A500 **ENERGY EFFICIENCY**

SECTION A501 **GENERAL**

A501.1 Scope. The provisions of this section regulate the design, construction, commissioning, and operation of buildings and their associated building sites for the effective use of energy.

A501.2 Intent. This section is intended to provide flexibility to allow the use of innovative approaches and techniques to achieve the effective use of energy.

A501.3 Application. Buildings shall be designed and constructed in accordance with the International *Energy Conservation Code*.

SECTION A600 **WATER CONSERVATION AND EFFICIENCY**

SECTION A601 **GENERAL**

A601.1 Scope. The provisions of this section shall govern the means of conserving water, protecting water quality, and providing for safe water consumption.

SECTION A602 **FIXTURES, FITTINGS, EQUIPMENT AND APPLIANCES**

A602.1 Fitting and fixture consumption. Plumbing fixtures and fixture fittings shall comply with the maximum flow rates specified in Table A602.1.

Exceptions: The following fixtures and devices shall not be required to comply with the reduced flow rates in Table A602.1:

1. Service sinks, bath valves, pot fillers, laboratory faucets, utility faucets, and

- other fittings designated primarily for filling operations.
2. Fixtures, fittings, and devices whose primary purpose is safety.

**TABLE A602.1
MAXIMUM FLOW RATES AND FLUSH VOLUMES**

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE OR FLUSH VOLUME
Showerhead ^a	2.0 gpm
Lavatory faucet and bar sink-private	1.6 gpm
Lavatory faucet-public (metering)	0.25 gpc ^b
Lavatory faucet-public (non-metering)	0.5 gpm
Kitchen faucet-private	2.2 gpm
Kitchen and bar sink faucets in other than dwelling units and guest rooms	2.2 gpm
Urinal	0.5 gpf or nonwater urinal
Water closet	1.28 gpf ^{c,d}
Prerinse Spray Valves	1.3 gpm
Drinking Fountains (manual)	0.7 gpm
Drinking Fountains (metered)	0.25 gpc ^b

a. Includes hand showers, body sprays, rainfall panels and jets.

b. Gallons per cycle.

c. Dual flush water closets in public bathrooms shall have a maximum full flush of 1.28.

d. The flush volume for water closets that are located at least 30 feet upstream of other drain line connections or fixtures and having less than 1.5 fixture units upstream of the water closet's connection to the drain line shall be not more than 1.6 gpf.

A602.1.1 Showerhead compensating valves. Showerhead(s) shall be supplied by automatic compensating valves that comply with ASSE 1016 or ASME A112.18.1/CSA B125.1 and are designed to function at the flow rate of the showerheads being used.

A602.2 Multiple water outlet showers. For showers with multiple water outlets, the maximum shower flow rate shall apply to the combined flow of all water outlets that are capable of being operated simultaneously. The combined flow rate shall include, but shall not be limited to, hand showers, rain systems, waterfalls, body sprays, and jets. Multiple water outlet showers shall comply with at least one of the following flow rate limits:

1. Shower compartment - 2.0 gpm, or 2.0 gpm per 2600 in² of shower compartment floor area.
2. Gang shower - 2.0 gpm per shower position
3. Shower compartment complying with Chapter 11 of the International Building Code - 4.0 gpm or 4.0 gpm / 2600 in² of shower compartment floor area.

A602.3 Combination tub and shower valves. Tub spout leakage from combination tub and shower valves that occurs where the outlet flow is diverted to the shower shall be not more than 0.1 gpm, measured in accordance with ASME A112.18.1/CSA B125.1.

A602.4 Nonwater urinal connection. The fixture drain for nonwater urinals shall connect to a branch drain that serves one or more lavatories, water closets or water-using urinals that discharge upstream of nonwater urinals.

A602.5 Trap priming water. Trap primers that allow continuous water flow shall be prohibited. Trap primers shall use not more than 30 gallons per year per trap.

A602.5.1 Trap primer filtration. Non-potable water utilized by pressurized trap primer devices shall be filtered by a 100 micron or finer filter.

A602.6 Appliances and other equipment. Appliances and equipment specified and present at the time of final inspection shall be in compliance with the requirements of Section A602.6.1 through A602.6.

A602.6.1 Once-through cooling for appliances and equipment. Once-through or single-pass cooling shall be prohibited.

A602.6.2 Clothes washers. Clothes washers rated with a water factor shall have a water factor of not

more than 6.0. Clothes washers rated with a modified energy factor shall have a modified energy factor of not less than 2.0.

A602.6.3.1 Dipper Wells. The water supply to a dipper well shall have a shutoff valve and flow control valve. The flow shall not exceed 1 gpm (3.78 lpm) at a supply pressure of 60 psi (413.7 kPa).

A602.6.3.2 Food waste disposal. The disposal of food wastes that are collected as part of preparing ware for washing shall be accomplished by one or more of the following:

1. A food strainer (scraper) basket that is emptied into a trash or compost.
2. A garbage grinder where the water flow into the food waste disposer is controlled by a load sensing device such that the water flow does not exceed 1 gpm under no-load operating conditions and 8 gpm under full-load operating conditions.
3. A pulper or mechanical strainer that uses not more than 2 gpm.

A602.6.3.3 Pre-rinse spray heads. Food service pre-rinse spray heads shall have a maximum flow rate in accordance with Table A602.1 and shall shut off automatically when released.

A602.6.3.4 Hand washing faucets. Faucets for hand washing sinks in food service preparation and serving areas shall be of the self-closing type.

SECTION A700 **INDOOR ENVIRONMENTAL QUALITY**

SECTION A701 **GENERAL**

A701.1 Scope. The provisions of this chapter shall govern the impact of the interior environment on human health and well-being.

A702 **AIR CIRCULATION SYSTEM**

A702.1 Air circulation requirements. Air circulation systems shall meet the requirements of Sections A702.2 through A702.5.

A702.2 Duct protection during construction. Duct and other air distribution component openings shall be covered with tape, plastic, sheet metal or other approved method from the time of rough-in installation until startup of the heating and cooling equipment. Dust and debris shall be cleaned from duct openings prior to building occupancy.

A702.3 Sealed air handler. Air handlers with a flow rate of less than 3000 cfm shall have a manufacturer's designation of air leakage. The air handler air leakage shall be not more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.

A702.4 Air handling system access. Air handlers, air filters, fans, coils and condensate pans shall be provided with access for purposes of cleaning, repair, and replacement.

A702.5 Filters. Filters for air-conditioning systems that serve occupied spaces shall be rated at MERV 11 or higher, in accordance with ASHRAE Standard 52.2, and system equipment shall be designed to be compatible. The air-handling system design shall account for pressure drop across the filter. The pressure drop across clean MERV 11 filters shall be not greater than 0.45 in. w.c. at 500 FPM (412 Pa at 2.54 m/s) filter face velocity. Filter performance shall be shown on the filter manufacturer's data sheet.

SECTION A703 **SPECIFIC INDOOR AIR QUALITY MEASURES**

A703.1 Fireplaces and appliances. Where located within buildings, fireplaces, solid fuel-burning appliances, vented decorative gas appliances, vented gas fireplace heaters and decorative gas

appliances for installation in fireplaces shall comply with Sections A703.1.1 through A703.1.3. Unvented room heaters and unvented decorative appliances, including alcohol burning appliances, shall be prohibited.

A703.1.1 Venting and combustion air. Fireplaces and fuel-burning appliances shall be vented to the outdoors and shall be provided with combustion air from the outdoors in accordance with the *International Mechanical Code and the International Fuel Gas Code*. Solid-fuel-burning fireplaces shall be provided with combustion air directly from the outdoors and shall be provided with a means to tightly close off the chimney flue and combustion air outlets when the fireplace is not in use.

A703.3 Wood-fired appliances. Wood stoves and wood-burning fireplace inserts shall be listed.

A703.4 Biomass appliances. Biomass fireplaces, stoves and inserts shall be listed and labeled in accordance with ASTM E1509 or UL 1482. Biomass furnaces shall be listed and labeled in accordance with CSA B366.1 or UL391. Biomass boilers shall be listed and labeled in accordance with CSA B366.1 or UL 2523.

SECTION A800 **REFERENCED STANDARDS**

ASHRAE

193-2010 Method of Test for Determining the Air Tightness of HVAC Equipment

CSA

CAN/CSA-ISO 14025:07(R2012) Environmental Labels and Declarations - Type III Environmental Declarations - Principles and Procedures (Adopted ISO 14025:2006, first edition, 2006-07-01)

ISO

21930:2007 – Sustainability in building construction – Environmental declaration of building products

UL

391-2006 Solid-fuel and Combination-fuel Central and Supplementary Furnaces-with Revisions through March 2010

All other standards referenced by this Appendix are identified in the Referenced Standards chapter of the 2012 IgCC.

Reason: This "Alternative IgCC" is intended to be a standalone, usable green code. It provides an option that some will find more practical.

The addition of the full IgCC, or even trying to decide what part of the existing IgCC to start with, is daunting. The Alternative IgCC can answer requests from top elected and appointed officials for "green", where the city councils and elected officials want to become green, preferably now. These may be jurisdictions that have adopted a stringent energy code, but perhaps are not really enforcing it. The price of complexity and ambiguity in the code is a lack of compliance. If there is no compliance, there is no impact. Simple works.

Most Building Departments are understaffed and underfunded and don't have the resources to enforce a complicated green code. The Alternative IgCC is a place to start for some, and an end point for others. It is intended to be achievable in a typical jurisdiction without a major training and staffing effort. The Alternative IgCC is intended to be usable for all the buildings, including small buildings in small jurisdictions. Green experts may understand the IgCC, but most building officials don't have time to study and understand the entire IGCC as it currently exists.

Ratings, complexity, and new and initially untested requirements belong in rating systems, not codes. LEED is a leading edge program. The IgCC is not LEED. The IgCC and LEED have different roles and are not mutually exclusive.

Let's be honest...the IGCC is seeing very little adoption and, therefore, use. When adopted by a jurisdiction, it is often limited in what it applies to, perhaps to a list of options, is made "voluntary", or is applied only to the jurisdiction's buildings. For a specific example, Dallas adopted the IgCC as a code and deleted five entire chapters, including the entire energy chapter. Dallas deleted Chapters 2 (definitions), 6 (energy), 9 (commissioning), 10 (existing buildings) and 11 (existing sites). Dallas also deleted parts of Chapters 4 (site), 5 (materials), and 8 (indoor environment). This Alternative IgCC is very similar to what Dallas did. (An overview of what Dallas did is at http://www.dallascityhall.com/building_inspection/pdf/Overview.pdf.) To have a chance of broad use we need a much more usable green code.

The order of this Alternative IgCC follows roughly that of the IgCC. Parts are deleted, clarified and/or condensed. An overview follows. Note that section numbers starting with "A" are the new Alternative IgCC. Section numbers without the "A" are the existing IgCC.

Section A100 – Scope and Administration (existing Chapter 1).

Much of what is in the existing Chapter 1 is retained in the new Section 100. The changes clarify and simplify the code.

- Choice of IgCC or ASHRAE 189.1 (new A101.3.1). The choice between the IgCC and ASHRAE 189.1 is fundamental to the IgCC. However the existing IgCC makes it hard to even find that choice. The existing ASHRAE 189.1 reference is spread over two chapters; as item #4 of section 101.3's exceptions and in section 301.1.1. The proposed section (new A101.3.1) places it in one sentence on the first page.
- Residential text is removed. The IgCC is fundamentally a commercial code. The existing IgCC spreads the residential option into Section 101.3 in exception #1's three subparts, Section 302.1 item #1 and Table 302.1's first three rows. The confusing residential option is removed. Jurisdictions can still adopt the ICC 700 National Green Building Standard or another program for residential construction as a separate action. The exception for residential buildings uses the IECC definition of residential buildings (new A101.3 item #3).
- IgCC provisions outside the Alternative IgCC must be specifically adopted (new A101.4). This allows a jurisdiction to add back provisions, if desired. "Provisions shall not apply unless specifically adopted" is handled like the existing section 101.4 that states that IgCC appendices apply only if specifically adopted.
- Remove redundant sentence. The last sentences in existing sections 101.2 and 101.5 are identical. This proposal leaves the sentence only in section A101.5.
- Most restrictive governs (new A102.1, existing 102.1). Where code sections have different requirements the existing Section 102.1 says "the most practical requirement" shall govern. Who decides the practicality and how? Is that term used in any other code? The new section specifies "the most restrictive" shall govern, matching the language of Section 102.1 of the IBC. The term "most restrictive" is easier to enforce than "most practical requirement".

Part 2 – Administration and Enforcement.

--The existing Sections 103 to 109 are retained as in the new A103 to A109. A few editorial changes improve readability.

Section A200, definitions, are mentioned below where they apply. Most IgCC terms are not used in the Alternative IgCC or are covered in other I-codes. An overlay code requires that the main I-codes have been adopted, so definitions in other I-codes do not need to be repeated.

The **existing Chapter 3** (jurisdictional requirements, building lifecycle analysis) is not included in the Alternative IgCC. The variety of combinations of jurisdictional requirements encourages differences between jurisdictions, moving away from the I-code principal of "one code".

- Existing Table 302.1 is removed. Reasons for not including parts of the table, in order of the items in the existing table:
- Residential items are out of scope. The Alternative IgCC is commercial only. Also, the existing requirements are confusing and spread over two chapters in the IgCC.
- Zoning requirements are not helpful. The first six options under "Chapter 4" in the existing table are zoning-related, usually handled by a different department, will often conflict with the jurisdiction's existing zoning regulations, and are often set by state or Federal law.
- High occupancy vehicle parking is unenforceable. Will there be parking lot police to check incoming vehicles, funded by the building department?
- Parking for "Low-emission, hybrid and electric vehicle" is out of date or undefined. The definition says "EPA Tier 2, California LEV-II, or a minimum of EPA LEV standards". EPA Tier II and California LEV-II have been requirements since 2010. If the IgCC targeted the next levels, it should have referenced EPA and California Tier III, which will also probably be required in the near future. "EPA LEV standards" does not describe a specific standard, nor is such a standard in the IgCC references.
- (See "Implementation Schedule" at <http://www.epa.gov/otaq/standards/light-duty/tier2stds.htm> and <http://www.arb.ca.gov/msprog/levprog/levii/factsht.pdf>. Also <http://www.epa.gov/otaq/documents/tier3/420f13018a.pdf>).
- zEPI is not the calculation used by the IECC or ASHRAE 189.1 and is inappropriate for an overlay code. Any IgCC energy calculations should be based on the IECC energy calculation.
- Post construction IAQ and acoustical requirements are excessive and are well beyond what jurisdictions can or will enforce.
- Existing buildings section/requirement is too complicated. We need to get a code that works for new buildings before taking on existing buildings.
- Anything post occupancy is removed. It is beyond the scope of the code. If post occupancy requirements are adopted, they should use a separate document.
- Whole Building Life Cycle Assessment (LCS) is removed (existing section 303). It is complex, vaguely defined, and lacks a minimum or base case. The LCA requires a complex report, but has nothing to compare the report to, no "baseline". How is the code user going to demonstrate that the project has a "20% improvement in environmental performance" without a minimum or base case? The LCA referenced standard, ISO 14044 states in its Section 1 (Scope) "This International Standard is not intended for contractual or regulatory purposes or registration and certification." Section 303 is mentioned only once in the IgCC, as an alternative in 505.1.

Section A300 - Site Development And Land Use (was Chapter 4)

The Alternative IgCC simplifies most site and land development requirements, and makes them more enforceable. Zoning is not included. Inventories and plans in the Alternative IgCC are eliminated in favor of just stating the requirement(s).

As contrasted to the existing IgCC:

- Zoning is not in the Alternative IgCC (eliminated most of existing 402.2 through 402.8). Most jurisdictions already have their own zoning requirements. Zoning is not usually handled by the departments that would enforce a green code.
- Stormwater management is simplified, but retains many of the existing requirements (new A302.6, existing 403). Storm water management is a key aspect of green site design, limits construction damage, and potentially enhances the environmental quality of the site. Existing rules on storm water run off to adjacent lots are retained (new A302.6.3, existing 403.1.2).
- Management of soil and vegetation simplifies 3 pages of IgCC (existing 405) into new A302.2 to A302.4.
- Practical rules for protection of soil, vegetation, and reuse of soil are proposed (new A302.2, A302.3 and A302.4), replacing three pages of IgCC requirements on the same subjects in Section 405.

- The list of "invasive plant species" and "preferred plant species" is to be provided by the jurisdiction (new A302.7, existing 202, 401.2, 405.2.2, 408.3.2). The existing definitions are not clear enough to define specific plants. The list of preferred plants will usually be more inclusive than just "native" and will likely include plants that are not "native" but are well adapted to the climate. Preferred plants need to be more than just native plants; for example, plants that have adapted well and grasses that don't require extensive watering. A new definition of "preferred plant species" is given.
- Landscape irrigation and outdoor fountains are not included in the Alternative IgCC (existing 404). Some of this topic is now in the IPC. The existing requirement in the IgCC is also overly complicated; for example, requiring calculation of a "mid summer baseline (existing 404.1.2).
- Building waste management is simplified (new A303, existing 406). There is no percentage calculation, but exceptions for jurisdictional, state, or Federal regulations; or those deemed impractical by the code official.
- Shading hardscape is complex and not specific to cooling climates (existing 408.2.1, 408.2.2, 408.2.3) where it is beneficial.
- Cool roofs are now in the IECC and are not in the Alternative IgCC (existing 408.3). Heat island mitigation (existing Section 404) is best handled in the IECC, where cool roof requirements reside.
- Pervious and permeable pavement is retained (new A302.5, existing 408.2.4)
- Bicycle parking requirements are simplified (new A303, existing 407.2, 407.3)
This removes the distinction between long-term and short-term parking, as the bike parking equipment will be the same. The number of required spaces is based on occupant load, as defined in the IBC, rather than the existing table (existing Table 407.3). The cost of showers and changing facilities required in the existing IgCC is excessive and is removed (existing 407.2).
- Parking for High Occupancy Vehicles is not enforceable (existing 407.4.1).
- Parking for "Low-emission, hybrid and electric vehicle" is out of date or undefined.
- High Occupancy Vehicle parking is not enforceable (existing 407.4.1).
- Parking for "Low-emission, hybrid and electric vehicle" is out of date or undefined (existing 407.4.1, 407.4.2). See discussion above under Chapter 3.
- Light pollution control doesn't belong in IgCC (existing 409.1). Examples of inappropriate content includes uplighting, backlighting, and lighting in national parks.

Section A400 - Material Resource Conservation and Efficiency (was Chapter 5).

The Alternative IgCC has two main material elements, limiting construction waste and providing information on the impacts of products used in the building.

- Waste management and recycling is somewhat simpler, but retains most content (new A402, existing 503). A plan is specified with simpler code language. Hazardous waste should count as waste. Hazardous waste is counted as waste rather than being exempted by the existing IgCC (existing 503, first sentence). Off-site sorting is specifically recognized, as is often a cost-effective option to manage construction waste. The existing IgCC does not preclude it, but doesn't specifically recognize it.
- Waste not exceeding 3 lb/ft2 of floor area is a new option (new A402.1 item #1). This option is lower than the average building, but within the range of what is currently seen in the field. The overall goal is to limit waste to a low level. Good design can eliminate much of the waste without having to divert it.
- Reference to IFC's combustible waste material requirements is added (new A402.2).
- Requirements for post occupancy recycling storage are vague or unenforceable (existing 504). Storage areas for "recycled materials", post occupancy, lack specific enforceable requirements. In other words, would any storage do, regardless of size or composition? Should one find a bin or shelf and hang a sign that says "put recyclables here"?
- Provision for used materials is kept but redundant section is removed (new A105.2.1, existing 105.2.1, 505.2.1). Existing section 505.2.1 roughly duplicates existing 105.2.1.
- Single attribute materials characteristic requirements are eliminated (existing section 505) The requirement to meet one of the product attributes is unnecessary, as the attributes are so common that buildings usually comply without any change, making this section "busy work". The single-attribute requirements are: used, recycled, recyclable, bio-based, and/or indigenous. For example, consider concrete and steel, two common heavy materials. Steel averaged 88% recycled content in 2012 (<http://www.recycle-steel.org/Recycling%20Resources/~media/Files/SRI/Releases/003%20Steel%20Recycling%20Rates%20Graphs.pdf>). Common steel products, such as rebar, include more than 95% recycled content. Concrete is typically 60% to 75% aggregate. (<http://www.cement.org/cement-concrete-basics/how-concrete-is-made>) The concrete aggregate, stone and sand, will always be local, certainly well within the 500 mile radius allowed for "indigenous" materials. Many buildings would get to 55% by weight based on the use of steel and concrete alone.
- Replaced single-attribute options with a requirement for statements on the environmental impacts of products in the building (new A402).
Environmental Product Declarations (EPDs) are emerging as a way to compare the environmental performance of competing products, including a product's impact from its manufacture to ultimate disposal. EPDs encourage manufacturers to reduce their environmental impacts by making it more likely that product buyers will compare competing products based on a broad set of environmental attributes.
Enforcing the new section is simple for the building official. No calculations are required. If there are 10 EPDs for products in the building, the criteria would be met.
- Redundant section on used materials is eliminated. (existing 505.2.1 roughly duplicates existing 105.2.1, new section is A105.2.1.)
- Lamp section is not included (existing 506). Some IgCC requirements are exceeded by industry voluntary standards <http://www.nema.org/Policy/Environmental-Stewardship/Lamps/Pages/CFL-Mercury.aspx> Because industry does not mark mercury content of lamps, this is also hard to enforce.
- Moisture sections are not included in the Alternative IgCC (existing 507 and 502.1.2). The existing sections are not specific enough to enforce this. Moisture is covered better elsewhere in the I-codes.

Section A500 – Energy (was Chapter 6)

The Alternative IgCC is simply a reference to the IECC. Enforceability of the existing IgCC energy chapter is the largest complaint for those looking at the IgCC. Many code officials and builders want to just use the IECC. Few could read

through the chapter and understand it. Even catching up with all the accumulated changes in the 2015 IECC will be a challenge to some.

--The main calculations in the energy chapter, the zEPI and CO2 emission calculations, are not the same as the IECC or ASHRAE 90.1 (existing 602). This is not an overlay to the IECC. The IECC and ASHRAE 90.1 compare options based on energy cost, but the IgCC does not. The IgCC energy chapter does not have the same scope as the IECC. The IGCC says "The annual energy use shall include all energy used for building functions and its anticipated occupancy" (existing 602.1.2) which includes energy use outside the scope of the IECC. The zEPI is not defined in a usable way, as the zEPI definition says the zEPI is compared to the "average energy performance of buildings relative to a benchmark year".

Average of which buildings? Why not compare it to the IECC requirements for the building under consideration? For what benchmark year?

--IgCC calculations are not even in the same units as the IECC or ASHRAE 90.1. The IECC energy calculation is based on limiting energy costs, a concept close to the heart of building owners and operators. Likewise, ASHRAE 90.1 and ASHRAE 189.1 are also based on energy costs. None of the calculations in the IgCC are based on energy costs.

--If jurisdictions want energy savings beyond the IECC, then that level of efficiency should be based on the existing calculation in the IECC. For example, require an additional 5% in energy savings beyond the IECC based on the calculation and scope of the existing IECC. This would take only one sentence and would be understandable by all.

--Many parts of the IGCC energy chapter are already in the IECC. For example, much of the building envelope (existing 605), building mechanical (existing 606), water heating (existing 607) and commissioning (existing 611) sections are in the IECC.

Section 600 – Water (was Chapter 7)

Large parts of IgCC's water-related requirements were moved into the IPC this code cycle as part of the Group A changes and therefore do not appear in the Alternative IGCC (existing 706 through 710). These included requirements for graywater, reclaimed water, rainwater and other onsite nonpotable. Those same requirements will likely be removed from Chapter 7 in the IGCC as well.

Comparing the Alternative IgCC to the existing IgCC:

--Fitting and fixture maximum flow rates and flush volumes are retained (new A602.1, existing 702.1). Table footnotes were rewritten to be more understandable. The showerhead compensating value requirement was moved from a footnote to part of the code body (new A602.1.1, existing Table 702.1 footnote "a"). Flow rate exceptions were added for fixtures where the purpose is safety or filling operations (new A602.1).

--Text for showers with multiple water outlets was simplified to be more readable and given its own section (new A602.2, existing 702.1 items #1, #2, #3).

--Some sections were unchanged: combination tube and shower valves (new A602.3, existing 702.2); non-water urinal connection (new A602.4, existing 702.5); dipper wells (new A602.6.3.1, existing 702.12); food service hand washing faucets (new A602.6.3.4, existing 702.11.)

--References to Energy Star, a non-consensus standard, were replaced with specific technical requirements (new A602.6.2, existing 702.6.1)

--Options were added for the food waste disposers (new A602.6.3.2, existing 702.16). This added compost, trash, pulper, or mechanical strainer options.

--Efficient hot and tempered water distribution now exists in the IECC and was removed (existing 702.8).

--Trap primer requirements were simplified (new A602.5, existing 702.9). A requirement for a trap primer filter was added for non-potable water.

--Some of the more complicated items were not included in the Alternative IgCC (cooling towers, condensate related requirements, vehicle wash facilities, some equipment in the existing 702 and 703 (xxx), water powered pumps (existing 702.10), exhaust scrubbers (existing 703.8) evaporative cooling (existing 703.9), water treatment devices (existing 704), and water sub metering (existing 705).

Section 700 – Indoor Environmental Quality (existing Chapter 8)

The Alternative IgCC includes requirements for air movement systems and combustion devices.

--Ducts are to be protected and cleaned prior to occupancy (new A702.2). This is similar to the IgCC (existing 803.1.1).

--Adds a requirement that air handlers be sealed (new 702.3) which is the same requirement as in the residential IECC (2012 IECC section R403.2.2.1). This provides a specification for the existing commercial IECC requirement that air handlers be sealed (2012 IECC section C403.2.7). The referenced ASHRAE standard for air handler air tightness is in common use in the industry for air handlers less than 3000 cfm.

--Retains the requirement that parts of the air moving system be provided with access for cleaning, repair and replacement (new 702.4, existing 802.2).

--Retains the requirement for a high quality air filter (new A702.5, existing 803.5).

--Retains the same requirements for fireplace and appliance venting and combustion air (new 703.1, existing 804.1). The only change is the elimination of the non-consensus EPA woodstove standard (existing 804.1.2).

--Alternative IgCC does not include the extensive VOC requirements (existing 806), energy wasting construction phase air quality requirements (803.1.2, 803.1.3), or acoustics requirements (existing 807).

--Daylighting requirements reside in the IECC (existing 808). Duplication in the Alternative IGCC would be confusing.

Existing Chapters 9, 10 and 11 (commissioning, existing buildings, existing sites) are not included in the Alternative IGCC.

--Commissioning. Much of the commissioning for energy is now in the IECC. Post occupancy commissioning elements are outside the scope of the IgCC. Many of the commissioning requirements deal with topics that are not in the Alternative IgCC. Enforcement of other I-codes will effectively provide some of the commissioning elements in the existing Chapter 9.

--Existing buildings and existing sites are not included in the Alternative IgCC (existing Chapters 10 and 11). The IgCC needs to get new buildings working prior to adding existing buildings or existing sites.

Please help us create a usable Alternative IgCC within the IgCC.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the International Green Construction Code. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GG 320-14: APPENDIX A (NEW)-CONNER1196

GG321-14

Appendix A

Proponent: Hope Medina, representing self (hmedina@coloradocode.net)

Delete without substitution:

~~APPENDIX A~~ **~~PROJECT ELECTIVES~~**

Reason: The IgCC does not need more complexity and variability in the form of project electives. Understanding all of the options in Appendix A adds to the burden of adopting jurisdictions as they try to understand all the options, including the requirement to decide specifically how many electives in each of the five Appendix A tables of options to require (Section A102.2). Where adopted, Appendix A increases the complexity of the IgCC as code staff needs to learn all the 40+ electives. Maintaining the IgCC as a overlay code document is made more difficult by the need to maintain the individual sections in Appendix A as those Appendix A sections reference other parts of the IgCC or other I-codes. Deleting Appendix A helps move towards a more usable IgCC.

Cost Impact: Will not increase the cost of construction.

GG321-14 : APPENDIX A- MEDINA1213

GG322-14

A101.1, A102, A102.1, A103, A103.1, A102.2, A103, Table A103.2, A104, A104.1, A105, A105.2, A106, A106.1, A106.2, A107, A108

Proponent: Brenda Thompson, Clark County Development Services, Las Vegas, NV,
Chair, ICC Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC)

Revise as follows:

A101.1 Scope. The provisions of this appendix are designed to ~~offer encourage and recognize the implementation of environmentally beneficial conservation~~ practices that achieve greater benefit than the minimum requirements of the *International Green Construction Code*.

SECTION ~~A102~~ A103 DEFINITIONS

PROJECT ELECTIVE. A provision that becomes mandatory and enforceable only where selected by the owner by indication in Table A103.2. ~~The minimum total number of project electives that must be selected and complied with as indicated in Section A102.2 and Tables A104, A105, A106, A107 and A108.~~

SECTION ~~A103~~ A102 APPLICABILITY AND CONFORMANCE

~~A103.1~~ A102.4 General. Project electives shall be applicable to buildings, structures and building sites constructed under the provisions of this code.

~~A103.2~~ A102.2 Required number of and selection of project electives. The jurisdiction shall indicate the number of *project electives* required in the blank provided in the row that references ~~Section A102.2 in Tables A104, A105, A106, A107 and A108.~~ Each project constructed in the jurisdiction shall be required to comply with this number of *project electives*. A total of not less than 3 ~~this number of project electives~~ shall be selected by the owner from Table A103.2 ~~each table~~. Selected *project electives* shall be applied as mandatory requirements for the project. Selected *project electives* shall be communicated to the code official by means of checking the appropriate boxes in the table and providing a copy of the tables, or by inclusion of a list of selected *project electives*, with the construction documents. A completed copy of Table A103.2 shall be provided to the owner by the jurisdiction at the time of the issuance of the Certificate of Occupancy.

Add new table as follows:

**TABLE A103.2
PROJECT ELECTIVES**

<u>Section</u>	<u>Description</u>	<u>Owner Selections</u>
<u>A104.1.1</u> <u>A101.1.2</u> <u>A101.1.3</u>	<u>Flood hazard area preservation</u> <u>Flood hazard area minimization</u> <u>Flood hazard area, existing building</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A104.2</u>	<u>Wildlife corridor</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A104.3</u>	<u>Infill site</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A104.4</u>	<u>Brownfield site</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A104.5</u>	<u>Site restoration</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No

A104.6	<u>Mixed use development</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.7	<u>Changing and shower facilities</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.8	<u>Long term bicycle parking and storage</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.9 A104.9.1 A104.9.2 A104.9.3 A104.9.4	<u>Heat island</u> <u>Site hardscape project elective 1</u> <u>Site hardscape project elective 2</u> <u>Site hardscape project elective 3</u> <u>Roof covering project elective</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.1	<u>Waste management</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.2	<u>Construction waste landfill maximum</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.3(1)	<u>Reused, recycled content, recyclable, bio-based and indigenous materials (70%)</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.3(2)	<u>Reused, recycled content, recyclable, bio-based and indigenous materials (85%)</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.4	<u>Service life plan</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.5	<u>Design for deconstruction and building reuse</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.6	<u>Existing building reuse</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.7	<u>Historic building reuse</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	<u>Project zEPI is at least 5 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 10 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 15 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 20 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 25 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 30 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 35 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 40 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 45 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u>Project zEPI is at least 51 points lower than required by Table 302.1</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.2	<u>Mechanical systems project elective</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.3	<u>Service Water Heating</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.4	<u>Lighting Systems</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No

A106.5	<u>Passive Design</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	<u>Renewable Energy Systems - 5 Percent</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	<u>Renewable Energy Systems - 10 Percent</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	<u>Renewable Energy Systems - 20 Percent</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A107.2	<u>On-site wastewater treatment</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A107.3	<u>Alternate on-site non-potable water for outdoor hose connections</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A107.4	<u>Alternate on-site non-potable water for plumbing fixture flushing</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A107.5	<u>Automatic fire sprinkler system</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A107.6	<u>Alternate on-site non-potable water to fire pumps</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A107.7	<u>Alternate on-site non-potable water for industrial process makeup water</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A107.8	<u>Alternate on-site non-potable water for cooling tower makeup water</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A107.9	<u>Graywater collection</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.2	<u>VOC emissions - flooring</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.3	<u>VOC emissions – ceiling systems</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.4	<u>VOC emissions- wall systems</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.5	<u>Total VOC limit</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.6	<u>Views to building exterior</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No

Delete the following without substitution:

**TABLE A104
SITE PROJECT ELECTIVES**

Revise as follows:

A104.1 Flood hazard area project elective. Where Section 402.2.1 is not listed in Table 302.1 as a mandatory requirement, and in specific flood hazard areas if Section 402.2.2 is not a mandatory requirement, projects seeking *flood hazard area project electives* in accordance with Section A102.2 shall comply with one of the *project electives* identified in Sections A104.1.1 through A104.1.3.

Delete the following without substitution:

**TABLE A105
MATERIAL RESOURCE CONSERVATION AND EFFICIENCY**

Revise as follows:

A105.2 Construction waste landfill maximum project elective. Projects seeking a construction waste landfill maximum *project elective* in accordance with ~~Table A105 and Section A102.2~~ shall comply with Section 503.1 except that not more than 4 pounds of construction waste, excluding *hardscape*, per square foot of building area shall be disposed of in a landfill. Building construction waste and *hardscape* waste shall be measured separately.

Delete the following without substitution:

~~TABLE A106
ENERGY CONSERVATION AND EFFICIENCY~~

Revise as follows:

A106.1 zEPI reduction project electives. *Project electives for buildings* pursuing performance-based compliance in accordance with Section 601.3.1 shall be in accordance with the portions of Table ~~A103.2~~ ~~A106.4~~ that reference Section A106.1, Equation 6-1 and the calculation procedures specified in Section 602.1.2.1.

A106.2 Mechanical systems project elective. *Buildings* seeking a mechanical systems project elective in accordance with ~~Sections A102.2 and A106~~ shall comply with Sections A106.2.1 through A106.2.5.

Delete the following without substitution:

~~TABLE A107
WATER RESOURCE CONSERVATION AND EFFICIENCY~~

~~TABLE A108
INDOOR ENVIRONMENTAL QUALITY AND COMFORT~~

Reason: Many of the tables in Appendix A allow jurisdictions to choose to require compliance with a relatively large number of project electives that may be unrealistic and pose hardships for owner and designers.

Where jurisdictions adopt the provisions of Appendix A, they are required to select a minimum number of project electives that must be satisfied on each project from each of the following Tables: A104, A105, A106, A107 and A108. However, the high end of the range of recommended values in many cases is extremely difficult for most projects to comply with. For example, requiring that 10 of the 17 energy related project electives from Table A106 be satisfied would come close to requiring that all buildings in a jurisdiction be net-zero energy buildings. Though that may be an admirable long term goal, it may pose a significant hardship for most projects and create a negative market reaction to the code. This proposal remedies that situation by combining all project electives back into one table, as they were in IgCC Public Versions 1 and 2. The proposal no longer requires jurisdictions to select a value as the number of project electives that must be satisfied on each project. It sets that number at 3 for all projects. This is a relatively minimal value that will not pose a hardship for owners, yet will encourage them to explore and become familiar with the environmentally beneficial practices that project electives encourage. Furthermore, the new table has been structured to show all project electives that have not only been selected by the owner, but also that they have been verified and approved by the code official. This recognizes building performance that exceeds the minimum requirements in the body of the IgCC, and simultaneously encourages the implementation of these practices. The jurisdiction is required to indicate all project electives it has verified and approved in the far right column of the table. The jurisdiction is also required to attach a copy of Table A102 to the Certificate of Occupancy. Thus building owners can advertise the verified high performance attributes of their building, use these attributes to possibly reduce insurance premiums. This further encourages the implementation of project electives, while avoiding the pitfalls inherent in rating systems, virtually all of which are, in reality, poor indicators of building performance.

The following are a few examples of how the current recommended values in the current tables are difficult to comply with:

Section and Table A104 contains 13 project electives related to site development and land use. Table A104 requires that the jurisdiction indicate a number between 0 and 6 as the minimum total number of site related project electives that must be satisfied on each project. Jurisdictions should note that, although the first impulse may be that 6 is not an aggressive number of site related project electives given that 13 are available, few of these electives will actually be available to most projects.

Section A105 contains 7 project electives related to material resource conservation and efficiency. Table A105 requires that the jurisdiction indicate a number between 0 and 4 as the minimum total number of material resource conservation and efficiency related project electives that must be satisfied on each project. Jurisdictions should note that, as 2 of the Section A105 project electives are available only for existing and historic buildings, 4 may be an overly aggressive number of material resource conservation related project electives to expect most buildings to comply with.

Section A106 contains 17 project electives related to material resource conservation and efficiency. Table A106 requires that the jurisdictions indicate a number between 0 and 10 as the minimum total number of material resource conservation and efficiency related project electives that must be satisfied on each project. Jurisdictions should note that 10 electives from this table may be very challenging to implement for most projects.

The definitions were moved forward from Section A103 to Section A102 because the definition of "Project elective" is critical to the understanding of the provisions of this appendix.

Cost Impact: Will not increase the cost of construction.

GG322-14 : A101.1-THOMPSON347

GG323-14

202, A105.4.1

Proponent: Dru Meadows, representing theGreenTeam, Inc. (dmeadows@thegreenteaminc.com)

Revise as follows:

A103 DEFINITIONS

DESIGNLIFE. The intended service life or the period of time targeted for that a building or its component parts ~~are expected~~ to meet or exceed the performance requirements.

Add new definition as follows:

A103 DEFINITIONS

REFERENCE SERVICE LIFE. The period of time after installation during which a building or its component parts are expected to meet or exceed the performance requirements.

Revise as follows:

A105.4.1 Plan and components. The building service life plan (BSLP) shall indicate the intended length in years of the design ~~service~~ life for the building as determined by the building owner or *registered design professional*, and shall include a maintenance, repair, and replacement schedule for each of the following components. The maintenance, repair and replacement schedule shall be based on manufacturer's reference service life data or other *approved* sources for the building components. The manufacturer's reference service life data or data from other *approved* sources shall be included in the documentation.

1. Structural elements and concealed materials and assemblies.
2. Materials and assemblies where replacement is cost prohibitive or impractical.
3. Major materials and assemblies that is replaceable.
4. Roof coverings.
5. Mechanical, electrical and plumbing equipment and systems.
6. Site hardscape.

Reason: The definitions for "Design Life" and "Service Life" were approved for inclusion in the 2012 IgCC. The proposed revision to the definition of "Design Life" and the proposed new definition for "Reference Service Life" are intended to coordinate better with the use of these terms by industry professionals. Essentially,

- Design Life: How long you want it to last.
- Service Life: How long it really does last.
- Reference Service Life: How long it should last.

These terms are used in Section A105.4 and need to be included in the definitions.

Cost Impact: Will not increase the cost of construction

GG323-14 : 202-DESIGN LIFE-MEADOWS687

GG324-14

A104, A104.10 (New), A104.10.1 (New), A104.10.2 (New)

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com); Christine Sheppard, representing American Bird Conservancy (csheppard@abcbirds.org); Guy Maxwell, representing Ennead Architects, LLP

Revise as follows:

**TABLE A104
SITE PROJECT ELECTIVES**

		MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 6 to establish the minimum total number of project electives that must be satisfied.	—
A104.1.1 A101.1.2 A101.1.3	Flood hazard area preservation Flood hazard area minimization Flood hazard area, existing building	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.2	Wildlife corridor	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.3	Infill site	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.4	Brownfield site	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.5	Site restoration	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.6	Mixed use development	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.7	Changing and shower facilities	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.8	Long-term bicycle parking and storage	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.9 A104.9.1 A104.9.2 A104.9.3 A104.9.	Heat island Site hardscape project elective 1 Site hardscape project elective 2 Site hardscape project elective 3 Roof covering project elective	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A104.10</u>	<u>Bird collision deterrence</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No

Add new text as follows:

A104.10 Bird Collision Deterrence. Where projects are intended to qualify for a bird collision deterrence project elective, exterior wall materials shall be selected so that the total building bird collision threat rating shall not exceed 15. The total bird collision threat rating for buildings three stories or less



above grade shall be calculated in accordance with equation A-1. For all other buildings the total bird collision threat rating shall be calculated in accordance with equation A-2.

$$\begin{aligned} \text{BCTR}_{\text{TB}} &= \text{BCTR}_{\text{A}} && \text{(Equation A-1)} \\ \text{BCTR}_{\text{TB}} &= [(2 \times \text{BCTR}_{\text{A}}) + \text{BCTR}_{\text{B}}] / 3 && \text{(Equation A-2)} \end{aligned}$$

where:

$$\begin{aligned} \text{BCTR}_{\text{TB}} &= \text{total building bird collision threat rating} \\ \text{BCTR}_{\text{A}} &= \text{bird collision threat rating for façade zone A determined in accordance with Section A104.10.1} \\ \text{BCTR}_{\text{B}} &= \text{bird collision threat rating for façade zone B determined in accordance with Section A104.10.2} \end{aligned}$$

**TABLE A104.10
BIRD COLLISION THREAT FACTORS**

<u>Material Type</u>	<u>Threat Factor</u>
Opaque surfaces that do not transmit light	0
Fiberglass panels	0
Insect screens installed not less than 2 inches from exterior surface of fenestration	0
External horizontal louvers spaced not more than 2 inches on center	0
External vertical louvers spaced not more than 4 inches on center	0
Frit pattern: not less than 1/8-inch thickness horizontal opaque lines spaced not more than 2 inches on center	13
Frit pattern: not less than 1/8-inch thickness horizontal opaque lines spaced not more than 1.5 inches on center	9
Frit pattern: not less than 1/8-inch thickness horizontal opaque lines spaced not more than 4 inches on center	22
Frit pattern: not less than 1/4-inch thickness vertical opaque lines spaced not more than 4 inches on center	13
Frit pattern: not less than 1/8-inch thickness horizontal or vertical opaque lines spaced not more than 1/2" on center	8
Frit pattern: not less than 1/8-inch diameter opaque dot array, not less than 20% coverage	41
Frit pattern: not less than 1/8-inch diameter opaque dot array, not less than 40% coverage	34
Frit pattern: not less than 1/4-inch x 1/4" opaque squares spaced not more than 2 inches on center vertically and horizontally	29
Frit pattern: not less than 3/8-inch x 3/8-inch opaque squares spaced not more than 2 inches on center vertically and horizontally	15
All Other	100

A104.10.1 Façade Zone A. Façade zone A shall consist of the first three stories of above grade exterior wall. The bird collision threat rating for façade zone A shall be a weighted average of the individual threat factors for each material used in this façade zone, as determined in accordance with equation A-3.

$$\text{BCTR}_{\text{A}} = \frac{\sum (\text{TF}_{1,2} \times \text{WA}_{1,2} / \text{TA}_{\text{A}})}{\sum (\text{WA}_{1,2} / \text{TA}_{\text{A}})} + \dots \quad \text{(Equation A-3)}$$

where:

$$\begin{aligned} \text{BCTR}_{\text{A}} &= \text{bird collision threat rating for façade zone A} \\ \text{TF}_{1,2} &= \text{The threat factor for each material type, as determined in accordance with Table A104.10.} \\ \text{WA}_{1,2} &= \text{The wall area of each material type.} \\ \text{TA}_{\text{A}} &= \text{The total above grade wall area for façade zone A.} \end{aligned}$$

A104.10.2 Façade Zone B. Façade zone B shall consist of all above grade exterior wall that is not part of façade zone A. The bird collision threat rating for façade zone B shall be a weighted average of the individual threat factors for each material used in this façade zone, determined in accordance with equation A-4.

$$\text{BCTR}_B = \frac{\sum(\text{TF}_1 \times \text{WA}_1 / \text{TA}_B) + (\text{TF}_2 \times \text{WA}_2 / \text{TA}_B) + \dots}{\text{TA}_B} \quad \text{(Equation A-4)}$$

where:

BCTR_B = bird collision threat rating for façade zone B

$\text{TF}_{1,2}$ = The threat factor for each material type, as determined in accordance with Table A104.10.

$\text{WA}_{1,2}$ = The wall area of each material type.

TA_B = The total above grade wall area for façade zone B.

Reason: Collision with buildings is the single biggest known killer of birds in the United States. Collisions occur in virtually every environment, from urban to rural. The most recent estimate, based on a meta-analysis of data from across the country, is that 635 million birds die each year in collisions with buildings. Biologists consider this to be a significant factor in the decline of populations of wild birds. Birds have intrinsic value but also provide irreplaceable ecological services, including habitat regeneration and pest control.

Research has shown that glass located between ground level and treetops is responsible for most collisions. Glass is invisible to both birds and humans, but humans learn to “see” glass, through a combination of experience and contextual cues. Unfortunately, most birds’ first encounter with glass is fatal. They collide at full speed when they try to fly to sky, trees or other objects seen through glass or reflected from its surface. Death from collisions is frequently not instantaneous and may occur as a result of internal hemorrhaging days after impact, far away from the original collision site.

Where humans are usually looking in the direction they’re moving, birds must also be alert to possible predators coming from behind, so their eyes are on the sides of their heads. They have limited depth perception and poor contrast sensitivity. Patterns placed on glass to alert birds don’t cause birds to understand that glass is there – a single decal to them is something they could fly around. To be perceived as a barrier, patterns must treat entire surfaces and preferably be integral to the glass.

For several years the glass industry has been collaborating with wildlife advocates to introduce “bird friendly” glass options, and to finance research into reducing bird collisions. However, far too many buildings are built without considering these products. Research in the U.S. and Austria has shown that effective visual signals should be based on the body size of small songbirds. Birds are reluctant to fly between vertical lines less than 4” apart. They also avoid flying between horizontal lines less than 2” apart. These dimensions are the basis for recommendations for creating bird-friendly fenestration patterns or screen materials. Common patterns have been tested and are represented, with relative “threat factor” scores, in the proposed table. Testing of proposed solutions started in the early 1990’s, using field trials which scored the relative number of birds killed or injured by glass with different treatments placed near feeders, and through aviary trials, where birds were presented with the choice of two flight paths, one invisible clear glass, the other modified by a test pattern. A major testing program developed in Austria in 2003 took the concept of the aviary choice trials and expanded it to what is now called “tunnel testing”, incorporating a net so that birds are not injured, using large sample sizes of diverse species and controlling factors such as light intensity. This test is now an official standard for bird-friendly glass evaluation in Austria. (See annotated bibliography, including bird tunnel testing protocols, at <http://collisions.abcbirds.org/research.html>)

The first tunnel in the U.S. was constructed in Pennsylvania in 2009 and has been used both for research and to provide relative threat ratings for commercial materials, including fritted glass, window films, decals, tapes and coatings. These ratings were used in the development of LEED Pilot Credit #55: Reducing Bird Collisions. Minnesota incorporated a bird-friendly design requirement in their Sustainable Building Guidelines, starting in May 2013. San Francisco adopted Bird-safe Building Standards in 2011 and Oakland followed suit in 2013. In 2009, the Toronto City Council passed a motion making parts of the Toronto Green Standard – which includes bird-friendly design and applies to all new construction in the city – mandatory. As of 2013, building owners in Ontario, Canada are held legally responsible for bird deaths caused by collisions with glass.

Glass is a critically important building material, connecting people in a building to the environment outside while bringing warmth and daylight inside. Using bird-friendly glass in priority applications will enhance sustainable design, benefitting both birds and humans.

Cost Impact: Will increase the cost of construction. Projects choosing this elective may incur additional costs for frit patterns applied to fenestration.

GG324-14 : A104.10 (NEW)-BAILEY705

GG325-14

A105.4.1

Proponent: Dru Meadows, theGreenTeam, Inc., representing theGreenTeam, Inc.
(dmeadows@thegreenteaminc.com)

A105.4 Building service life plan project electives. Projects seeking a building service life plan project elective shall comply with this section. The building service life plan (BSLP) in accordance with Section A105.4.1 shall be included in the construction documents.

Revise as follows:

A105.4.1 Plan and components. The building service life plan (BSLP) shall indicate the intended length in years of the design ~~service~~ life for the building as determined by the building owner or *registered design professional*, and shall include a maintenance, repair, and replacement schedule for each of the following components. The maintenance, repair and replacement schedule shall be based on manufacturer's reference service life data or other *approved* sources for the building components. The manufacturer's reference service life data or data from other *approved* sources shall be included in the documentation.

1. Structural elements and concealed materials and assemblies.
2. Materials and assemblies where replacement is cost prohibitive or impractical.
3. Major materials and assemblies that are replaceable.
4. Roof coverings.
5. Mechanical, electrical and plumbing equipment and systems.
6. Site hardscape.

Reason: "design service life" is not a recognized term in the industry. This may be an editorial issue. It seems to be a merge of the term "design life" and the term "service life"

As used in this context (i.e. the "intended" life), the appropriate term is "design life" "Design life" refers to the targeted or intended lifespan; "service life" refers to the actual lifespan.

Cost Impact: Will not increase the cost of construction

GG325-14 : A105.4-MEADOWS685

GG326-14
A105, A105.8 (New)

Proponent: Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov)

Add new text as follows:

A105.8 Deconstruction project elective. Projects seeking a *deconstruction* project elective shall comply with Section 503.1 and this section. *Buildings*, structures or portions thereof that are to be *demolished shall be systematically disassembled by means of deconstruction.*

TABLE A105
MATERIAL RESOURCE CONSERVATION AND EFFICIENCY

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 4 to establish the minimum total number of project electives that must be satisfied.	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.1	Waste management	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.2	Construction waste landfill maximum	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.3(1)	Reused, recycled content, recyclable, bio-based and indigenous materials (70%)	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.3(2)	Reused, recycled content, recyclable, bio-based and indigenous materials (85%)	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.4	Service life plan	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.5	Design for deconstruction and building reuse	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.6	Existing building reuse	<input type="checkbox"/> Yes <input type="checkbox"/> No
A105.7	Historic building reuse	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A105.8</u>	<u>Deconstruction project elective</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No

Reason: Choosing to deconstruct a structure as an alternative to demolition is a more labor intensive building removal method, but it yields a higher rate of salvage and material reuse. Preserving our virgin materials is a high priority in the IgCC, and there for taking the greater effort to deconstruct should be rewarded and allowed to achieve project elective credit.

Cost Impact: Will not increase the cost of construction.

GG326-14: A105.8 (NEW)-PETRIE1185

GG327-14

A103, A106.2.2.1, A106.2.5, A106.3.3

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IGCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IGCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Charles Foster, Steffes Corporation, representing Steffes Corporation (cfoster20187@yahoo.com)

Revise as follows:

A106.2.2.1 Heating equipment. For heating equipment, the part-load efficiency of the equipment shall be not less than 10 percent greater than the part-load efficiencies shown in the applicable tables of the *International Energy Conservation Code*, or ASHRAE 90.1, or the equipment shall be ENERGY STAR qualified, as applicable. Grid-interactive electric thermal storage heating systems shall be deemed to meet the requisites of this section where they are directly regulated by the grid operator to store energy during off-peak hours, to utilize available renewable energy or to provide balancing services for management of the electric grid.

A106.2.5 Service water heating equipment. The efficiency of the service water heating equipment shall be not less than 10 percent greater than the efficiencies shown in the *International Energy Conservation Code* and ASHRAE 90.1 or the service water heating equipment shall be ENERGY STAR qualified. Grid-interactive electric thermal storage heating systems shall be deemed to meet the requisites of this section where they are directly regulated by the grid operator to store energy during off-peak hours, to utilize available renewable energy or to provide balancing services for management of the electric grid.

A106.3.3 Service water heating efficiency. The efficiency of the service water heating equipment shall be at least 10 percent greater than the efficiencies shown in the *International Energy Conservation Code* and ASHRAE 90.1 or the service water heating equipment shall be ENERGY STAR qualified. Grid-interactive electric thermal storage heating systems shall be deemed to meet the requisites of this section where they are directly regulated by the grid operator to store energy during off-peak hours, to utilize available renewable energy or to provide balancing services for management of the electric grid.

Add new definition as follows:

SECTION A103 **DEFINITIONS**

GRID-INTERACTIVE ELECTRIC THERMAL STORAGE (GETS). An electric-powered heat storage system for space heating units and service water heating units that is controlled by electric system grid operators such as utilities, independent system operators (ISOs) and regional transmission organizations (RTOs).

Reason: During the first set of hearings for the first edition of the IGCC, there was much interest in Grid-Interactive Thermal Energy Storage and one of the panelist suggested that it sounded like GETS would be a good fit for the Project Electives section of the IGCC. Likewise, during the IECC code hearings in Atlantic City last fall, a number of the panelists expressed interest in GETS and stated they also thought GETS would be a good fit somewhere in the IGCC.

With that background, and without imposing any additional mandatory requirements, this proposal would add Grid-Interactive Electric Thermal Storage as one of the specifically identified means of meeting the requisites for project electives.

Section 601.2 of the IGCC states, "[t]his chapter is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve the effective use of energy."

Grid-Interactive Electric Thermal Storage is such an innovative approach with a growing reputation among market participants as a solution to some of today's most pressing energy issues.

1. Building owners like GETS because it provides affordable and dependable space and service water heating for their structures.
2. Electric grid operators like GETS because it helps them balance energy supply and demand in real time, thereby increasing grid stability while simultaneously reducing costs, energy and emissions. Maintaining grid stability becomes more challenging

as the output of renewable energy generation (like wind and solar) is added to electric grids which explains why grid operators across the country (as well as the Federal Energy Regulatory Commission and the U.S. Department of Energy) have expressed their support for energy storage.

3. Renewable energy developers like GETS because it complements their projects by providing cost-effective energy storage when renewable energy production exceeds demand. Without adequate energy storage, these projects are often curtailed.

What is a Grid-Interactive Electric Thermal System (“GETS”)?

For building owners and operators, GETS serve as traditional space and service water heating systems. GETS provide affordable and dependable space conditioning and domestic hot water. Nonetheless, GETS have significantly different operational and energy consumption characteristics from traditional space and service water heating systems as described in more detail below.

Thermal battery. Electric utilities dispatch their generators in the order from the most cost efficient (base load generation) to the least cost efficient (peaking load generation). GETS complements the efficient dispatch of generation by utilities by allowing the storage of energy that is produced more efficiently for use later, and by avoiding the requirement to operate less efficient generators at peak load conditions. GETS accomplishes this feat by charging (heating bricks, water, or other storage media) at times when utilities have excess capacity. Often this is at night but it can vary between utilities. Because the system is grid-interactive, a GETS can charge at times that are optimum for the utility, allowing utilities to efficiently manage their peak demands and their customer costs. Heat that is stored for later use effectively makes GETS a thermal battery.

Renewable energy. GETS is a unique complement to the generation of electricity from renewable energy like wind and solar. Many times peak power production from renewable energy sources does not coincide with a utility's demand for electricity. As an example, wind generation usually peaks at night when demand for energy is not usually the greatest. For that reason, Bonneville Power last year was forced to curtail the generation from wind generators at certain times because it didn't need all the electricity the wind generators were producing! GETS is a good fit for storing excess renewable energy and has been successfully deployed in Bonneville's service territory as well as the service territory of other electric utilities.

Reduces winter peak. When electrical demands on a utility's system grow, it is forced to dispatch less efficient generators to meet that demand, so to the extent demand is reduced the utility avoids costs (that would ultimately be passed on to customers) and saves energy. GETS allows the storage of energy produced by more efficient generators.

Replaces fossil fuel in utility grid control. When electrical demand on a utility's grid changes (up or down), the most immediate system response is for the grid's frequency to drift away from ideal (60 cycles per second). To control these frequency excursions, utilities have traditionally operated fossil fuel generators to add voltage to the grid to raise the frequency as it falls away from 60 cycles. Grid-interactive GETS can be dispatched in lieu of fossil fuel generators to remedy frequency excursions, thereby saving energy and costs. According to a Kema report, usage of a non-carbon emitting resource such as GETS for providing regulation services can reduce carbon emissions for regulation by nearly 65%.

GETS offer significant benefits to customers, including the ability to store renewable energy, the ability to reduce utility costs, and the ability to reduce the consumption of fossil fuel by utilities in the regulation of system frequency.

Bibliography:

See article at <http://www.pjm.com/about-pjm/exploring-tomorrows-grid/electricity-storage.aspx?p=1> for information on the value of ETS in the PJM Interconnection service territory.

See article at <http://www.sustainablebusinessoregon.com/articles/2012/04/bonneville-power-calls-for-first-wind.html?page=all> for information on Bonneville Power curtailment of wind generation amounting to almost 100,000 MWH's in 2011.

See Kema Consulting report (Commissioned by the U.S. Department of Energy under the supervision of Sandia National Laboratory) noting significant reduction in carbon emissions at <http://prod.sandia.gov/techlib/access-control.cgi/2008/088229.pdf>.

See <http://www.steffes.com/off-peak-heating/ets.html> for more information on utility benefits of WTS, including energy savings associated with thermal storage and frequency regulation.

See Sandia National Laboratory website at <http://www.sandia.gov/ess/> for information on the contributions of energy storage to electric grid stability.

For a detailed description of frequency regulation in North America see Department of Energy / National Energy Technology Laboratory Report Frequency Instability Problems in North American Interconnections, DOE/NETL-2011/1473, Final Report dated May 1, 2011 found at <http://www.netl.doe.gov/energy-analyses/pubs/TransmissionFreqProb.pdf>

Cost Impact: Will not increase the cost of construction.

GG327-14: A106.2.2.1-FOSTER999

GG328-14

A106.2.2.1, A106.2.2.2

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

A106.2.2.1 Heating equipment. For heating equipment, the part-load efficiency of the equipment shall be not less than 40 5 percent greater than the part-load, full-load, annual, or seasonal efficiencies shown in the applicable tables of the *International Energy Conservation Code* or ASHRAE 90.1, or the equipment shall be ENERGY STAR qualified, as applicable.

A106.2.2.2 Cooling equipment. For cooling equipment, the part-load efficiency of the equipment shall be not less than 40 5 percent greater than the part-load, full load, annual, or seasonal efficiencies shown in the applicable tables of the *International Energy Conservation Code*, or ASHRAE 90.1, or the equipment shall be ENERGY STAR qualified.

Reason: This change will improve the IgCC for the following reasons:

The minimum energy efficiency requirements for many types of heating and cooling equipment have been increased significantly in the latest versions of ASHRAE 90.1 and the IECC. Some of the increases have already taken place, and other increases will take effect by January 1, 2016. In addition, federal efficiency standards have increased for NAECA covered heating and cooling products (e.g., boiler efficiencies were increased in September 2012, and heat pumps and air conditioners will have efficiency increases by early 2015).

For many types of heating or cooling equipment shown in the ASHRAE / IECC tables, there is no information on "part load" efficiency. The only efficiency metric provided is on a full load basis (e.g., EER), seasonal basis (SEER, HSPF, COP), or annual basis (AFUE). Therefore, there is no way for a code official to enforce the provision of part load efficiency being increased for equipment that has no part load efficiency metric or value. This revision will allow building owners to specify equipment that will meet the increased threshold based on the actual efficiency rating of the product, and it will allow code officials to enforce such a provision.

Cost Impact: Will not increase the cost of construction.

GG328-14: A106.2.2.1-ROSENSTOCK515

GG329-14

A106.2.2.3, Table A106.2.2.3, A106.2.2.4

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

A106.2.2.3 Ground source or geothermal heat pumps. Ground source or geothermal heat pumps with a rated cooling capacity of 65,000 Btu/h or less shall meet the provisions of Table A106.2.2.3 based on the applicable referenced test procedure.

**TABLE A106.2.2.3
ENERGY-EFFICIENCY CRITERIA FOR GROUND SOURCE OR
GEOTHERMAL HEAT PUMPS**

PRODUCT TYPE ^a	MINIMUM EER	MINIMUM COP
Water-to-Air Closed loop TEST PROCEDURE - ISO 13256-1	14.1 <u>17.1</u>	3.3 <u>3.6</u>
Water-to-Air Open loop TEST PROCEDURE - ISO 13256-1	16.2 <u>21.1</u>	3.6 <u>4.1</u>
Water-to-Water Closed loop TEST PROCEDURE - ISO 13256-2	15.1 <u>16.1</u>	3.0 <u>3.1</u>
Water-to-Water Open loop TEST PROCEDURE - ISO 13256-2	19.1 <u>20.1</u>	3.4 <u>3.5</u>
Direct Expansion (DX) or Direct GeoExchange (DGX) TEST PROCEDURE - AHRI 870	15.0 <u>16.0</u>	3.5 <u>3.6</u>

EER = energy-efficiency ratio; COP = coefficient of performance

a. Efficiency values apply to units with a maximum rated cooling capacity of 65,000 Btu/h or less.

A106.2.2.4 Multi-stage ground source or geothermal heat pumps. The efficiency of multi-stage ground source or geothermal heat pumps shall meet the provisions of Table A106.2.2.3 based on the applicable referenced test procedure.

Reason: This proposal updates the values in Table A106.2.2.3 to match the Tier 3 values for Energy Star geothermal heat pumps that went into effect in 2012. Information about these values can be found at the following web site:

http://www.energystar.gov/index.cfm?c=geo_heat.pr_crit_geo_heat_pumps

In addition, there is the following language on the Energy Star web site: "Commercial (i.e., 3-phase) units are not eligible for qualification under the ENERGY STAR specification at this time." To make this table more technically accurate, there is new wording to show that these values are only for units that have capacities that are usually associated with single family homes.

Also, the web site only contains a definition for a geothermal heat pump, not a "ground source" heat pump, as shown below. To avoid market place confusion, the word geothermal has been added back in to this section.

Geothermal Heat Pump

A geothermal heat pump uses the thermal energy of the ground or groundwater to provide residential space conditioning and/or domestic water heating. A geothermal heat pump model normally consists of one or more factory-made assemblies that include indoor conditioning and/or domestic water heat exchanger(s), compressors, and a ground-side heat exchanger. A geothermal heat pump model may provide space heating, space cooling, domestic water heating, or a combination of these functions and may also include the functions of liquid circulation, thermal storage, air circulation, air cleaning, dehumidifying or humidifying. A geothermal heat pump system generally consists of one or more geothermal heat pump models, the ground heat exchanger(s), the air and/or hydronic space conditioning distribution system(s), temperature controls, and thermal storage tanks.

Cost Impact: Will increase the cost of construction. Products with higher efficiency values tend to have higher initial costs.

GG329-14: A106.2.2.3-ROSENSTOCK516

GG330-14

A106.2.2.3, Table A106.2.2.3, A106.2.2.4

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Delete without substitution:

~~**A106.2.2.3 Ground source heat pumps.** Ground source heat pumps shall meet the provisions of Table A106.2.2.3 based on the applicable referenced test procedure.~~

~~**A106.2.2.4 Multi-stage ground source heat pumps.** The efficiency of multi-stage ground source heat pumps shall meet the provisions of Table A106.2.2.3 based on the applicable referenced test procedure.~~

**TABLE A106.2.2.3
ENERGY-EFFICIENCY CRITERIA FOR GROUND SOURCE HEAT PUMPS**

PRODUCT TYPE	MINIMUM EER	MINIMUM COP
Water to Air Closed loop TEST PROCEDURE - ISO 13256-1	44.1	3.3
Water to Air Open loop TEST PROCEDURE - ISO 13256-1	46.2	3.6
Water to Water Closed loop TEST PROCEDURE - ISO 13256-2	45.1	3.0
Water to Water Open loop TEST PROCEDURE - ISO 13256-2	49.1	3.4
Direct Expansion (DX) or Direct GeoExchange (DGX) TEST PROCEDURE - AHRI 870	45.0	3.5

EER = energy efficiency ratio; COP = coefficient of performance

Reason: The project electives in Appendix A are intended to recognize performance that exceeds the minimum requirements in the body of the IgCC

As the project electives related to ground source heat pumps in Appendix A simply repeat the mandatory requirements in the body of the code (in Sections 606.2.2.1 and 606.2.2.2 and Table 606.2.2.1), and do not exceed the performance required in the body of the code, they should be deleted.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG330-14: A106.2.2.3-THOMPSON357

GG331-14

A107.5.3

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Richard Miller, representing FLSS IAFC (rmiller@iafc.org)

Revise as follows:

A107.5.3 Quality of water used for automatic fire suppression sprinkler system. The required quality and treatment of the nonpotable water stored and used for automatic fire suppression sprinkler system shall be ~~determined by authority(s) having jurisdiction~~ in accordance with the *International Fire Code*.

Reason: This section should be consistent with A107.5 for fire sprinkler systems elective. Having "suppression" in A107.5.3 adds in another type of system that the charging language in A107.5 doesn't provide for. The term "automatic fire sprinkler system" is also a defined term in the IBC/IFC.

As "determined by authority(s) having jurisdiction" is subjective and has the potential of non-uniform enforcement. While there are several ways to treat water, the water for automatic fire sprinklers systems must be treated in a way to be non-detrimental to the fire sprinkler system and as an agent.

The reference to the IFC is consistent with other sections of Appendix A. The IFC would require the sprinkler system to be installed according to NFPA 13. NFPA 13, Section 24.2.1 (below) has criteria in place for how treated water is reused in the sprinkler system. *A source of recycled or reclaimed water where the building owner (or their agent) has analyzed the source of the water and the treatment process (if any) that the water undergoes before being made available to the sprinkler system and determined that any materials, chemicals, or contaminants in the water will not be detrimental to the components of the sprinkler system it comes in contact with.

This proposal is approved by the Fire-CAC, but not reviewed by the SEHPCAC.

Cost Impact: Will not increase the cost of construction.

GG331-14: A107.5.3-MILLER444

GG332-14

A107.6, A107.6.1

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Richard Miller, representing FLSS IAFC (rmiller@iafc.org)

Revise as follows:

A107.6 Alternate onsite nonpotable water to fire pumps project elective. Where projects are intended to qualify for an *alternate onsite nonpotable water* to fire pumps project elective in accordance with Sections A107.6, one or more fire pumps shall be located within 200 feet (60 960 mm) of a nonpotable water collection system of sufficient quality, pressure, and capacity for fire pump applications and the fire pumps shall be connected to such source of nonpotable water. The connections shall be in accordance with Section ~~403.3.2~~ 913 of the *International Building Fire Code*.

A107.6.1 Quality of water used for fire suppression. The required quality and treatment of the nonpotable water stored and used by fire pumps for fire suppression and automatic fire sprinkler systems shall be ~~determined by the authority having jurisdiction~~ in accordance with the *International Fire Code*.

Reason: Section 403.3 of the IBC is for high rise fire pump connections and requires connections to water mains. What of other buildings that are not high rise? If redundancy is desired, then a reference to 913 of the IFC would reference to NFPA 20 which has redundancy requirements for water supply in high rise buildings. NFPA 20 also has connection requirements for non-high rise buildings.

The quality of the nonpotable water used by fire pumps should be compatible with all systems (suppression and fire sprinklers) supplied by the fire pump. The water for a standpipe system may be treated differently than a combined system of standpipe and fire sprinklers. This change helps the user be aware of what the fire pump supplies.

"This proposal is approved by the Fire-CAC, but not reviewed by the SEHPCAC"

Cost Impact: Will not increase the cost of construction.

GG332-14: A107.6-MILLER445

GG333-14

Table A108, A108.1, A108.5 (New)

Proponent: Timothy Serie, representing American Coatings Association
(tserie@paint.org)

Revise as follows:

**TABLE A108
INDOOR ENVIRONMENTAL QUALITY AND COMFORT**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 3 to establish the minimum total number of project electives that must be satisfied.	—
A108.2	VOC emissions—flooring	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.3	VOC emissions—ceiling systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.4	VOC emissions—wall systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A108.5</u>	<u>Architectural paints and coatings project elective</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.5 A108.6	Total VOC limit	<input type="checkbox"/> Yes <input type="checkbox"/> No
A108.6 A108.7	Views to building exterior	<input type="checkbox"/> Yes <input type="checkbox"/> No

Revise as follows:

A108.1 VOC emissions project electives. Sections A108.2 through A108.56 shall be considered to be separate project electives. The electives shall be cumulative and compliance with each project elective shall be recognized individually.

Add new text as follows:

A108.5 Architectural paints and coatings project elective. Where projects are intended to qualify for an architectural paints and coatings project elective, a minimum of 85 percent by weight or volume, of site-applied interior architectural coatings applied to walls, floors, and ceilings shall comply with the alternate emissions limits in Table 806.3(2). Compliance with Table 806.3(2) for architectural coating alternate emissions shall be determined utilizing test methodology incorporated by reference in CDPH/EHLB/Standard Method V.1.1. The alternative emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 accreditation.

Reason: This proposal rewards projects that specify architectural paint and coatings that meet both the VOC content requirements and the product emissions testing evaluations in IgCC section 806.3, instead of either/or. This new project elective in the IgCC will encourage and recognize a greater level of performance, where feasible, by addressing both VOC content and product emissions. This proposed section is fitting as a project elective since product emission testing evaluation is costly and impractical for all coating lines and types. According to the project elective description, “Green and sustainable practices that are seldom or never appropriate as mandatory

requirements for all projects in all regions, or where they are intended to encourage and recognize, but not necessarily require, higher building performance, are typically more appropriately integrated in the code as project electives." Including this provision as a project elective encourages performance testing that exceeds the mandatory provisions of the IgCC, while acknowledging that it is not practically or technically feasible for all coatings products and building projects to meet these more demanding requirements.

Cost Impact: Will increase the cost of construction

GG333-14 : A108.5 (NEW)-SERIE1169

GG334-14

Appendix B

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner, self (craig.conner@mac.com)

Delete without substitution:

APPENDIX B RADON MITIGATION

Reason: The provisions almost exactly duplicate the radon requirements in the IRC.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GG 334-14 : APPENDIX B- KLEIN1220

GG335-140

Appendix C

Proponent: Hope Medina, Colorado Code Consulting, LLC, representing self
(hmedina@coloradocode.net)

Delete without substitution:

~~APPENDIX C~~ ~~OPTIONAL ORDINANCE~~

Reason: The Appendix C is not required since a model ordinance is already located in the main body of the IgCC.

Cost Impact: Will not increase the cost of construction

GG335-14 : APPENDIX C-MEDINA1222

GG334-14

Appendix D

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner, self (craig.conner@mac.com)

Delete without substitution:

~~APPENDIX D~~ ~~ENFORCEMENT PROCEDURES~~

Reason: Appendix D ~~is~~ diverges from being an overlay by duplicating some of the administrative functions outside of the IBC.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GG 336-14:APPENDIX D-KLEIN1224

GG337-14

Appendix E (New), Chapter 12

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Michael Cudahy, representing Plastic Pipe and Fittings Association (mikec@cmservices.com)

Add new appendix as follows:

APPENDIX E PIPING STANDARDS FOR VARIOUS APPLICATIONS

E101 PLASTIC PIPING.

E101.1 Plastic piping standards. Table E101.1 provides a list of plastic piping product standards for various applications.

TABLE E101.1
PLASTIC PIPING STANDARDS FOR VARIOUS APPLICATIONS^{a,b}

APPLICATION	LOCATION	TYPE OF PLASTIC PIPING									
		ABS	CPVC	PE	PE-AL-PE	PE-RT	PEX	PEX-AL-PEX	PP	PVC	
<u>CENTRAL VACUUM</u>	<u>SYSTEM PIPING</u>	-	-	-	-	-	-	-	-	-	<u>ASTM F2158</u>
<u>FOUNDATION DRAINAGE</u>	<u>SYSTEM PIPING</u>	<u>ASTM F628</u>	-	<u>ASTM F405</u>	-	-	-	-	-	-	<u>ASTM D2665</u> <u>ASTM D2729</u> <u>ASTM D3034</u>
<u>GEOHERMAL GROUNDLOOP</u>	<u>SYSTEM PIPING</u>	-	<u>ASTM F441</u> <u>ASTM F442</u> <u>ASTM F2855</u> <u>ASTM D2846</u> <u>CSA B137.6</u>	<u>ASTM D2239</u> <u>ASTM D2737</u> <u>ASTM D3035</u>	<u>ASTM F1282</u>	<u>ASTM F2623</u> <u>ASTM F2769</u>	<u>ASTM F876</u> <u>CSA B137.5</u>	<u>ASTM F1281</u>	<u>ASTM F2389</u> <u>CSA B137.11</u>	-	<u>ASTM D1785</u> <u>ASTM D2241</u> <u>CSA B137.3</u>

APPLICATION	LOCATION	TYPE OF PLASTIC PIPING								
		ABS	CPVC	PE	PE-AL-PE	PE-RT	PEX	PEX-AL-PEX	PP	PVC
	LOOP PIPING	=	=	ASTM D2239 ASTM D2737 ASTM D3035 NSF358 -1	ASTM F1282	ASTM F2623 ASTM F2769	ASTM F876 CSA B137.5	=	ASTM F2389 CSA B137.11	=
GRAY WATER	NON-PRESSURE DISTRIBUTION / COLLECTION	ASTM F628	=	ASTM D2239 ASTM D2737 ASTM D3035 ASTM F2306	=	=	=	=	ASTM F2389 CSA B137.11	ASTM F891 ASTM D2949 ASTM D1785 ASTM D2729 ASTM D3034 ASTM F1760 CSA B137.3
	PRESSURE / DISTRIBUTION	=	ASTM F441 ASTM F442 ASTM F2855 ASTM D2846 CSA B137.6	ASTM D2239 ASTM D2737 ASTM D3035	ASTM F1282	ASTM F2623 ASTM F2769	ASTM F876 CSA B137.5	ASTM F1281	ASTM F2389 CSA B137.11	ASTM D1785 ASTM D2241 CSA B137.3
RADIANT COOLING	LOOP PIPING	=	ASTM F441 ASTM F442 ASTM F2855 ASTM D2846	ASTM D2239 ASTM D2737 ASTM D3035	ASTM F1282	ASTM F2623 ASTM F2769	ASTM F876 CSA B137.5	ASTM F1281	ASTM F2389 CSA B137.11	=

APPLICATION	LOCATION	TYPE OF PLASTIC PIPING								
		ABS	CPVC	PE	PE-AL-PE	PE-RT	PEX	PEX-AL-PEX	PP	PVC
RADIANT HEATING	LOOP PIPING	=	ASTM F441 ASTM F442 ASTM F2855 ASTM D2846	=	ASTM F1282	ASTM F2623 ASTM F2769	ASTM F876 CSA B137.5	ASTM F1281	ASTM F2389 CSA B137.11	=
RAINWATER HARVESTING	NON-PRESSURE / COLLECTION	ASTM F628	=	ASTM F1901	=	=	=	=	ASTM F2389 CSA B137.11	ASTM F891 ASTM D2949 ASTM D1785 ASTM D2729 ASTM F1760 CSA B137.3
	PRESSURE / DISTRIBUTION	=	ASTM F441 ASTM F442 ASTM F2855 ASTM D2846 CSA B137.6	ASTM D2239 ASTM D2737 ASTM D3035	ASTM F1282	ASTM F2623 ASTM F2769	ASTM F876 CSA B137.5	ASTM F1281	ASTM F2389 CSA B137.11	ASTM D1785 ASTM D2241 CSA B137.3
RADON VENTING	SYSTEM PIPING	ASTM F628	=	=	=	=	=	=	=	ASTM F891 ASTM D1785 ASTM F1760

APPLICATION	LOCATION	TYPE OF PLASTIC PIPING								
		ABS	CPVC	PE	PE-AL-PE	PE-RT	PEX	PEX-AL-PEX	PP	PVC
RECLAIMED WATER	MAIN TO BUILDING SERVICE	=	ASTM F441 ASTM F442 ASTM F2855 ASTM D2846 CSA B137.6	ASTM D3035 AWWA C901 CSA B137.1	ASTM F1282	ASTM F2623 ASTM F2769	ASTM F876 AWWA C904 CSA B137.5	=	ASTM F2389 CSA B137.11	ASTM D1785 ASTM D2241 AWWA C905 CSA B137.3
	PRESSURE / DISTRIBUTION / IRRIGATION	=	ASTM F441 ASTM F442 ASTM F2855 ASTM D2846 CSA B137.6	ASTM D2239 ASTM D2737 ASTM D3035	ASTM F1282	ASTM F2623 ASTM F2769	ASTM F876 CSA B137.5	ASTM F1281	ASTM F2389 CSA B137.11 AWWA C900	ASTM D1785 ASTM D2241 AWWA C900
RESIDENTIAL FIRE SPRINKLERS ^c	SPRINKLER PIPING	=	ASTM F441 ASTM F442 CSA B137.6 UL 1821	=	=	ASTM F2769	ASTM F876 CSA B137.5 UL 1821		ASTM F2389 CSA B137.11	=
SOLAR HEATING	PRESSURE / DISTRIBUTION		ASTM F441 ASTM F442 ASTM F2855 ASTM D2846	=	=	ASTM F2623 ASTM F2769	ASTM F876 CSA B137.5	ASTM F1281	ASTM F2389 CSA B137.11	=

- a. This table indicates manufacturing standards for plastic piping materials that are suitable for use in the applications indicated. Such applications support green and sustainable building practices. The system designer or the installer of piping shall verify that the piping chosen for an application complies with local codes and the recommendations of the manufacturer of the piping.
- b. Fittings applicable for the piping shall be as recommended by the manufacturer of the piping.
- c. Piping systems for fire sprinkler applications shall be listed for the application.

Add new standards to Appendix E only as follows:

ASTM

<u>F1760-01(2011)</u>	<u>Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed-Recycled Content</u>
<u>F1901-10</u>	<u>Standard Specification for Polyethylene (PE) Pipe and Fittings for Roof Drain Systems</u>
<u>F2158-08</u>	<u>Standard Specification for Residential Central-Vacuum Tube and Fittings</u>
<u>F2306-08</u>	<u>12 inch to 60 inch Annular Corrugated Profile-wall Polyethylene (PE) Pipe and Fittings for Gravity Flow Storm Sewer and Subsurface Drainage Applications</u>
<u>F2623-08</u>	<u>Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR 9 Tubing</u>
<u>F2855-12</u>	<u>Standard Specification for Chlorinated Poly(Vinyl Chloride)/Aluminum/Chlorinated Poly(Vinyl Chloride) (CPVC-AL-CPVC) Composite Pressure Tubing</u>

AWWA

<u>900-07</u>	<u>Polyvinyl chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 inch through 12 inch (100 mm through 300mm), for Water transmission and Distribution</u>
<u>905-10</u>	<u>Polyvinyl chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 inch through 48 inch (350mm through 1200mm), for Water transmission and Distribution</u>

NSF

<u>358-1-2012</u>	<u>Polyethylene Pipe and Fittings for Water-Based Ground-Source "Geothermal" Heat Pump Systems</u>
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UL

<u>1821-2011</u>	<u>Standard for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service</u>
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Reason: PPFA is recommending that this table to be added as an appendix. The table will assist builders and code officials to properly select and inspect plastic piping used in green and sustainable piping systems that may be encouraged or required due to other codes, standards or rating systems. These systems are often not covered in the model codes, and some guidance would improve the code until all the applications are covered in the code body.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ASTM F1760-01(2011), ASTM F1901-10, F2158-08, F2855-12, AWWA C900-07, C905-10, NSF358--2012 and UL 1821-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014. All other standards proposed for inclusion into the code are already in Chapter 12 of the 2012 IgCC..

GG337-14 : APPENDIXE (NEW)-CUDAHY836

GG338-14
Appendix E (New)

Proponent: Stephen Skalko, representing Stephen V. Skalko, PE & Associates, LLC (svskalko@cox.net); Stephen Szoke, Portland Cement Association (sszoke@cement.org); Tim Peng, National Read Mix Association

Add new text as follows:

APPENDIX E
ENHANCED BUILDING RESILIENCE

The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance. The provisions of this appendix are intended to take precedence over the requirements of the International Building Code in an effort to achieve an enhanced level of resiliency consistent with premise of green building design and construction.

SECTION E101
GENERAL

E101.1 Purpose. The purpose of this appendix is to promote enhanced public health, safety and general welfare and to reduce public and private property losses due to hazards and natural disasters associated with fires, flooding, high winds and earthquakes.

SECTION E102
BUILDING HEIGHTS AND AREA

E102.1 General. In order to limit the impact of fires on the *building* the *building* shall comply with Sections E102.1 through E102.3 and the requirements for Chapter 5 General Building Heights and Areas of the *International Building Code*.

E102.2 Building height, number of stories and allowable area. Building height, numbers of stories and allowable area shall be determined in accordance with E102.2.1 through E102.2.4

E102.2.1 Height in feet. The maximum height, in feet, of a building shall not exceed the limits specified in Table E102 (1). Table E102 (1) shall be used in lieu of Table 504.3, ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE, in the *International Building Code*

TABLE E102(1)
ALLOWABLE HEIGHT AND BUILDING AREAS^a

Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane. Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

		<u>TYPE OF CONSTRUCTION</u>					
		<u>Type I</u>		<u>Type II</u>	<u>Type III</u>	<u>Type IV</u>	<u>Type V</u>
		<u>A</u>	<u>B</u>	<u>A</u>	<u>A</u>	<u>HT</u>	<u>A</u>
	<u>HGT (feet)</u>	<u>UL</u>	<u>160</u>	<u>65</u>	<u>65</u>	<u>65</u>	<u>50</u>
		<u>STORIES (S)</u>					
<u>GROUP</u>		<u>Area (A)</u>					
<u>A-1</u>	<u>S</u>	<u>UL</u>	<u>5</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>2</u>
	<u>A</u>	<u>UL</u>	<u>UL</u>	<u>15,500</u>	<u>14,000</u>	<u>15,000</u>	<u>11,500</u>
<u>A-2</u>	<u>S</u>	<u>UL</u>	<u>11</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>2</u>

GROUP	HGT (feet)	TYPE OF CONSTRUCTION					
		Type I		Type II	Type III	Type IV	Type V
		A	B	A	A	HT	A
		UL	160	65	65	65	50
		STORIES (S) Area (A)					
	A	UL	UL	15,500	14,000	15,000	11,500
A-3	S	UL	11	3	3	3	2
	A	UL	UL	15,500	14,000	15,000	11,500
A-4	S	UL	11	3	3	3	2
	A	UL	UL	15,500	14,000	15,000	11,500
A-5	S	UL	UL	UL	UL	UL	UL
	A	UL	UL	UL	UL	UL	UL
B	S	UL	11	5	5	5	3
	A	UL	UL	37,500	28,500	36,000	18,000
E	S	UL	5	3	3	3	1
	A	UL	UL	26,500	23,500	25,500	18,500
F-1	S	UL	11	4	3	4	2
	A	UL	UL	25,000	19,000	33,500	14,000
F-2	S	UL	11	5	4	5	3
	A	UL	UL	37,500	28,500	50,500	21,000
H-1	S	1	1	1	1	1	1
	A	21,000	16,500	11,000	9,500	10,500	7,500
H-2 ^d	S	UL	3	2	2	2	1
	A	21,000	16,500	11,000	9,500	10,500	7,500
H-3 ^d	S	UL	6	4	4	4	2
	A	UL	60,000	26,500	17,500	25,500	10,000
H-4	S	UL	7	5	5	5	3
	A	UL	UL	37,500	28,500	36,000	18,000
H-5	S	4	4	3	3	3	3
	A	UL	UL	37,500	28,500	36,000	18,000
I-1	S	UL	9	4	4	4	3
	A	UL	55,000	19,000	16,500	18,000	10,500
I-2	S	UL	4	2	1	1	1
	A	UL	UL	15,000	12,000	12,000	9,500
I-3	S	UL	4	2	2	2	2
	A	UL	UL	15,000	10,500	12,000	7,500
I-4	S	UL	5	3	3	3	1
	A	UL	60,500	26,500	23,500	25,500	18,500
M	S	UL	11	4	4	4	3
	A	UL	UL	21,500	18,500	20,500	14,000
S-1	S	UL	11	4	3	4	3
	A	UL	48,000	26,000	26,000	25,500	14,000
S-2 ^{b, c}	S	UL	11	5	4	5	4
	A	UL	79,000	39,000	39,000	38,500	21,000
U ^c	S	UL	5	4	3	4	2
	A	UL	35,500	19,000	14,000	18,000	9,000

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

UL = Unlimited, NP = Not permitted.

E102.2.1.1 Towers, spires, steeples and other roof structures. Towers, spires, steeples and other roof structures shall be permitted to meet the requirements in Section 504.3, Height in feet, of the *International Building Code*.

E102.2.2 Number of stories. The maximum number of stories of a building shall not exceed the limits specified in Table E102 (1). Table E102 (1) shall be used in lieu of Table 504.4, ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE, in the *International Building Code*

E102.2.3 Allowable area factor, A_t. The allowable area factor, A_t, to be used in determining the allowable area of a building in accordance with Section 506.2.1, 506.2.3 or 506.2.4 of the *International Building Code* shall be as specified in Table E102 (1). For application of Equations 5-1, 5-2 and 5-3 of the *International Building Code*, the value of NS shall be equal to the allowable area factor, A_t, from Table E102(1). Table E102(1) shall be used lieu of Table 506.2, ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET, in the *International Building Code*

E102.2.4 Specific exceptions to Table E102 (1). See Chapter 4 of the *International Building Code* for specific exceptions to the height, in feet, number of stories and allowable area of buildings determined based on Table E102 (1)

E102.3 Mixed occupancy and incidental use separations. All buildings containing mixed occupancies and incidental uses shall be provided with fire rated separations in accordance with Sections E102.3.1 and E102.3.2.

E102.3.1 Mixed occupancy separations. All occupancies except incidental uses in Table E102 (3) shall be separated from each other by fire barriers in accordance with Table E102(2). Table E102 (2) shall be used in lieu of Table 508.4 REQUIRED SEPARATION OF OCCUPANCIES (HOURS) in the *International Building Code*

**TABLE E102(2)
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

Occupancy	A ^d	E	B	I	F-2, S-2 ^{b,c} , U ^b	F-1, S-1, M	H-1	H-2	H-3, H-4, H-5
A ^d	N	2	2	2	1	2	NP	4	3
E ^d	—	N	2	2	1	2	NP	4	3
B	—	—	N	2	1	2	NP	3	2
I	—	—	—	N	2	2	NP	NP	NP
F-2, S-2 ^{b,c} , U ^c	—	—	—	—	N	2	NP	4	3 ^a
F-1, S-1, M	—	—	—	—	—	N	NP	3	2 ^a
H-1	—	—	—	—	—	—	N	NP	NP
H-2	—	—	—	—	—	—	—	N	1
H-3, H-4, H-5	—	—	—	—	—	—	—	—	N

N = No separation requirement.

NP = Not permitted.

a. See Section 420 of the *International Building Code*.

b. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.

c. See Section 406.3.4 of the *International Building Code*.

d. Except as required in Section E104.7.1, E104.7.2, E104.9.1 and E 104.9.2, separation is not required between occupancies of the same classification.

E102.3.2 Separation of incidental uses. Incidental accessory occupancies shall be separated from the remainder of the building by fire barriers with a fire resistance rating in accordance with

Table E102 (3). Table E102 (3) shall be used in lieu of Table 509 INCIDENTAL USES in the *International Building Code*.

TABLE E102(3)
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
<u>Furnace room where any piece of equipment is over 400,000 Btu per hour input</u>	<u>1 hour</u>
<u>Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower</u>	<u>1 hour</u>
<u>Refrigerant machinery rooms</u>	<u>1 hour</u>
<u>Hydrogen cut-off rooms, not classified as Group H</u>	<u>1-hour in Group B, F, M, S and U occupancies.</u> <u>2-hours in Group A, E, I and R occupancies.</u>
<u>Incinerator rooms</u>	<u>2 hour and provide <i>automatic sprinkler system</i></u>
<u>Paint shops, not classified as Group H, located in occupancies other than Group F</u>	<u>2 hours and provide automatic fire-extinguishing system</u>
<u>In Group E occupancies, laboratories and vocational shops not classified as Group H</u>	<u>1 hour</u>
<u>In Group I-2 occupancies, laboratories not classified as Group H</u>	<u>1 hour and provide <i>automatic sprinkler system</i></u>
<u>In ambulatory care facilities, laboratories not classified as Group H</u>	<u>1 hour or provide <i>automatic sprinkler system</i></u>
<u>In Group I-2 laundry rooms over 100 square feet</u>	<u>1 hour</u>
<u>Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces</u>	<u>1 hour</u>
<u>In Group I-2, physical plant maintenance shops.</u>	<u>1 hour</u>
<u>In ambulatory care facilities or Group I-2 occupancies waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater</u>	<u>1 hour</u>
<u>In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet</u>	<u>1 hour</u>
<u>In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet</u>	<u>1 hour</u>
<u>Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons for flooded lead-acid, nickel cadmium or VRLA , or more than 1000 pounds for lithium-ion and lithium metal polymer used for facility standby power, emergency power or uninterrupted power supplies</u>	<u>1-hour in Group B, F, M, S and U occupancies.</u> <u>2-hours in Group A, E, I and R occupancies.</u>

SECTION E103
TYPES OF CONSTRUCTION

E103.1 General. In order to limit the impact of fires on the *building* the *building* shall comply with Section E103.2 and the requirements in Chapter 6, Types of Construction of the *International Building Code*.

E103.2 Fire-resistance rating. Building elements shall have a fire resistance rating not less than that specified in Table E103 (1) and exterior walls shall have a fire resistance rating not less than that specified in Table 602, Fire-Resistance Rating for Exterior Walls Based on Fire Separation Distance of the *International Building Code*. Table E103 (1) shall be used in lieu of Table 601 FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS) in the *International Building Code*.

**TABLE E103
FIRE-RESISTANCE RATING FOR BUILDING ELEMENTS (HOURS)^a**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary Structural Frame ^{g,h}	<u>3^b</u>	<u>2^b</u>	<u>1</u>	<u>NP</u>	<u>1</u>	<u>NP</u>	<u>HT</u>	<u>1</u>	<u>NP</u>
Bearing Walls									
Exterior ^{f,g}	<u>3</u>	<u>2</u>	<u>1</u>	<u>NP</u>	<u>2</u>	<u>NP</u>	<u>2</u>	<u>1</u>	<u>NP</u>
Interior	<u>3^b</u>	<u>2^b</u>	<u>1</u>	<u>NP</u>	<u>1</u>	<u>NP</u>	<u>1/HT</u>	<u>1</u>	<u>NP</u>
Tenant Separation Residential spaces Non-residential spaces All tenant spaces	See Section E104.7.1 and E104.9.1 See Section E104.7.2 and E104.9.2 See Section 402.4.2.1 of the <i>IBC</i>								
Non-bearing Walls and Partitions	See Table 602 of the <i>IBC</i>								
Exterior									
Non-bearing Walls and Partitions ^e	<u>0</u>	<u>0</u>	<u>0</u>	<u>NP</u>	<u>0</u>	<u>NP</u>	See Section 602.4.6 of the <i>IBC</i>	<u>0</u>	<u>NP</u>
Interior									
Floor Construction and Secondary Members ^h	<u>2</u>	<u>2</u>	<u>1</u>	<u>NP</u>	<u>1</u>	<u>NP</u>	<u>HT</u>	<u>1</u>	<u>NP</u>
Roof Construction and Secondary Members ^h	<u>1- 1/2^b</u>	<u>1^{c,d}</u>	<u>1^{c,d}</u>	<u>NP</u>	<u>1^{c,d}</u>	<u>NP</u>	<u>HT</u>	<u>1^{c,d}</u>	<u>NP</u>

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

- The requirements in this table take precedence over Table 601, *Fire resistance rating for building elements of the International Building Code*.
- Roof supports: Fire-resistance rating of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- Fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire retardant wood members shall be allowed to be used for such unprotected members.
- In all occupancies, heavy timber shall be allowed where 1-hour or less fire-resistance rating is required.
- Not less than the fire-resistance rating required by other Sections of the *International Building Code*.
- Not less than the fire-resistance rating based on fire separation distance (see Table 602 of the *International Building Code*).
- Not less than the fire-resistance rating as referenced in Section 704.10 of the *International Building Code*, *Exterior structural elements*.
- See Section 202 of the *International Building Code*, *Definitions*.

**SECTION E104
FIRE PROTECTION FEATURES**

E104.1 General. In order to limit the impact of fires on the *building* the *building* shall comply with Sections E104.1 through E104.12 and the requirements for Chapter 7 Fire and Smoke Protection Features of the *International Building Code*.

E104.2 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of the building shall not exceed the percentages specified in Table E104 (1). Table E104 (1) shall be used in lieu of Table 705.8 MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION in the *International Building Code*

TABLE E104(1)
MAXIMUM AREA OF EXTERIOR WALL OPENING BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION^a

Fire Separation Distance (feet)	Degree of Opening Protection	Allowable Areas^b
0 to less than 3 ^{c,d}	Unprotected (UP)	Not Permitted
	Protected (P)	Not Permitted
3 to less than 5 ^e	Unprotected (UP)	Not Permitted
	Protected (P)	15%
5 to less than 10 ^d	Unprotected (UP)	10%
	Protected (P)	25%
10 to less than 15 ^{f,g}	Unprotected (UP)	15%
	Protected (P)	45%
15 to less than 20 ^{f,g}	Unprotected (UP)	25%
	Protected (P)	75%
20 to less than 25 ^{f,g}	Unprotected (UP)	45%
	Protected (P)	No Limit
25 to less than 30 ^{f,g}	Unprotected (UP)	70%
	Protected (P)	No Limit
30 or greater	Unprotected (UP)	No Limit
	Protected (P)	Not Required

For SI: 1 foot = 304.8 mm

UP = Unprotected openings in buildings

P = Openings protected with an opening protective assembly in accordance with section 704.8.2 of the ICC *International Building Code*

- a. The requirements in this table take precedence over Table 705.8, *Maximum area of exterior wall openings based on fire separation distance and degree of opening protections of the Code*.
- b. Values indicated are the percentage of the area of the exterior wall per story.
- c. For the requirements for fire walls of buildings with differing heights see Section 705.6.1 of the ICC *International Building Code*.
- d. For openings in a fire wall for building on the same lot, see Section 705.8 of the ICC *International Building Code*.
- e. The maximum percentage of unprotected and protected openings shall be 25% for Group R-3 occupancies.
- f. The area of unprotected and protected openings shall not be limited for Group R-3 occupancies with a fire separation distance of 5 feet or greater.
- g. *International Building Code* Includes buildings accessory to Group R-3.

E104.3 Protected openings. The exception for opening protectives in Section 705.8.2, Protected openings of the *International Building Code*, shall not be permitted.

E104.4 Vertical separation of openings. Exception 2 that eliminates vertical separation of openings where automatic sprinklers are present in Section 705.8.5, Vertical separation of openings of the *International Building Code*, shall not be permitted.

E104.5 Parapets. Exceptions 4 and 5 in Section 705.11, Parapet construction of the *International Building Code* that eliminates exterior wall parapets shall not be permitted for Group R-2 occupancies.

E104.6 Fire walls. Fire walls shall meet the requirements of this section.

E104.6.1 Materials. Fire walls for all types of construction shall be of any approved noncombustible material permitted in NFPA 221.

E104.6.2 Fire-resistance rating. The fire-resistance ratings shall meet or exceed the ratings provided in Table E104 (2). Table E104 (2) shall be used in lieu of Table 706.4 FIRE WALL FIRE-RESISTANCE RATINGS in the *International Building Code*

TABLE E104(2)
FIRE WALL FIRE-RESISTANCE RATINGS

<u>GROUP</u>	<u>FIRE-RESISTANCE RATING (hours)</u>
A, B, E, H-4, I, R-1, R-2, U	3
F-1, H-3 ^a , H-5, M, S-1	3
H-1, H-2	4 ^a
F-2, S-2, R-3, R-4	2

a. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5 of the *International Building Code*.

E104.6.3 Horizontal continuity. Exception 3 in Section 706.5, Horizontal continuity of the *International Building Code* that allows termination of fire walls at the interior surface of noncombustible exterior sheathing where *automatic sprinkler systems* are present shall not be permitted.

E104.6.4 Vertical continuity. Exceptions 2 and 4 in Section 706.6, Vertical continuity of the *International Building Code* that allows termination of fire walls at the underside of roof sheathing or decks shall not be permitted.

E104.6.5 Openings. Exception 2 in Section 706.8, Openings of the *International Building Code* that allows increased area of openings through fire walls where *automatic sprinkler systems* are present shall not be permitted.

E104.7 Fire barriers. Fire barriers shall comply with the provisions of this section

E104.7.1 Separation of dwelling units and sleeping units. The separation between individual *dwelling units* and *sleeping units*, and between *dwelling units* and *sleeping units* and other spaces in the building shall be *fire barrier assemblies* or *horizontal assemblies* with a minimum *fire-resistance rating* of 2- hour.

E104.7.2 Separation of tenant spaces. Individual tenant spaces in a building shall be separated by *fire barrier assemblies* or *horizontal assemblies*, or both, with a minimum *fire-resistance rating* of 1-hour and the requirements of Section 508 Mixed Use and Occupancy of the *International Building Code*.

E104.7.3 [Add Section Title Here] Exception 1 in Section 707.6, Openings of the *International Building Code* that allows openings in a fire barrier to be larger than 156 sq ft where *automatic sprinkler systems* are provided shall not be permitted.

E104.8 Fire partitions. Fire partitions shall comply with the provisions of this section.

E104.8.1[Add Section Title Here] Fire partitions in Section 708.1, General of the *International Building Code*, shall not be permitted for walls separating dwelling units in the same building.

E104.8.2[Add Section Title Here] Fire partitions in Section 708.1, General of the *International Building Code*, shall not be permitted for walls separating sleeping units in the same building.

E104.8.3[Add Section Title Here] Fire partitions in Section 708.3, Fire-resistance rating of the *International Building Code*, shall not be permitted for corridor walls separating corridors from dwelling units or sleeping units in the same building.

E104.8.4[Add Section Title Here] Exceptions 1 and 2 in Section 708.3, Fire-resistance rating of the *International Building Code* that allows a reduction in the fire resistance rating of corridors and separations between dwelling units and sleeping units shall not be permitted.

E104.8.5[Add Section Title Here] Exception 6 in Section 708.4, Continuity of the *International Building Code* that allows elimination of fireblocking or draftstopping shall not be permitted.

E104.9 Horizontal assemblies. Horizontal assemblies shall comply with the requirements of this Section.

E104.9.1 Separation of dwelling units and sleeping units. The separation between individual *dwelling units* and *sleeping units*, and between *dwelling units* and *sleeping units* and other spaces in the building shall be *fire barrier assemblies* or *horizontal assemblies* with a minimum *fire-resistance rating* of 2- hour.

E104.9.2 Separation of tenant spaces. Individual tenant spaces in a building shall be separated by *fire barrier assemblies* or *horizontal assemblies*, or both, with a minimum *fire-resistance rating* of 1-hour and the requirements of Section 508, Mixed Use and Occupancy of the *International Building Code*.

E104.9.3[Add Section Title Here] The exception in Section 711.2.4.3, Fire-resistance rating of the *International Building Code* that allows a reduction of the fire-resistance rating of separations between dwelling unit and sleeping unit where *automatic sprinkler systems* are present shall not be permitted.

E104.10 Enclosed elevator lobby. Sprinkler protection or smoke partitions shall not be permitted to substitute for fire partitions in accordance with Section 708 for elevator lobby enclosures in Section 3007. Elevator lobbies of the *International Building Code* where fire partitions are required.

E104.11 Opening protectives. The provisions of this section shall apply to opening protectives.

E104.11.1[Add Section Title Here] The Exception in Section 716.5.5 Doors in interior exit stairways and ramps and exit passageways of the *International Building Code*, that eliminate the maximum transmitted temperature requirements shall not be permitted.

E104.12 Concealed spaces. The provisions of this section shall apply to concealed spaces.

E104.12.1 Groups R-1, R-2, R-3 and R-4. Exceptions 1 and 2 in Section 718.3.2, Groups R-1, R-2, R-3 and R-4 of the *International Building Code* that eliminate draftstopping where *automatic sprinkler systems* are present shall not be permitted for Groups R-1, R-2 or R-4 occupancies.

E104.12.2 Other groups. The exception in Section 718.3.3 Other groups of the *International Building Code* that eliminates draftstopping where *automatic sprinkler systems* are present shall not be permitted.

**SECTION E105
INTERIOR FINISHES**

E105.1 General. In order to limit the impact of fires on the *building* the *building* shall comply with Sections E105.1 through E105.3 and the requirements for Chapter 8 Interior Finishes of the *International Building Code*.

E105.2 Interior wall and ceiling finishes. Interior wall and ceiling finishes and conform to the requirements of this section.

E105.2.1 Finish by occupancy. Interior wall and ceiling finishes based on occupancy shall conform to the requirements in Table E105(1). Table E105(1) shall be used in lieu of Table 803.9 INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY in the *International Building Code*.

**TABLE E105
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY**

GROUP	EXIT ENCLOSURES AND EXIT PASSAGEWAYS^a	CORRIDORS	ROOMS AND ENCLOSED SPACES^b
A-1, A-2	<u>A</u>	<u>A</u>	<u>B</u>
A-3, A-4, A-5	<u>A</u>	<u>A</u>	<u>C</u>
B, E, M, R-1, R-4	<u>A</u>	<u>B</u>	<u>C</u>
F	<u>B</u>	<u>C</u>	<u>C</u>
H	<u>A</u>	<u>A</u>	<u>B</u>
I-1	<u>A</u>	<u>B</u>	<u>B</u>
I-2, I-3, I-4	<u>A</u>	<u>A</u>	<u>B</u>
R-2	<u>B</u>	<u>B</u>	<u>C</u>
R-3	<u>A</u>	<u>C</u>	<u>C</u>
S	<u>B</u>	<u>B</u>	<u>C</u>
U	No Restrictions		

For SI: 1 inch = 25.4 mm, 1 square inch = 0.0929m²

a. Class C interior finish materials shall be permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fire blocked as required by Section 803.11.1 of the *International Building Code*.

- b. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and rooms or spaces on both sides shall be considered as one. In determining the applicability of the requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.

E105.2.2 Set-out construction. Exception 1 in Section 803.11.2, Set out construction of the *International Building Code* for the Class A interior finish materials where *automatic sprinkler systems* are provided shall not be permitted.

E105.3 Interior floor finishes. The Exception in Section 804.4.2 Minimum critical radiant flux of the *International Building Code*, which eliminates the requirement for minimum critical radiant flux for floor finishes and floor coverings in exit enclosures, exit passageways, and corridors where *automatic sprinkler systems* are provided shall not be permitted.

SECTION E106 **FIRE PROTECTION FEATURES**

E106.1 General. In order to limit the impact of fires on the *building* the *building* shall comply with Sections E106.2 through E106.5 and the requirements for Chapter 9 Fire Protection Features of the *International Building Code*

E106.2 Automatic sprinkler protection. An *approved automatic sprinkler systems* shall be provided throughout all new buildings in accordance with Section E106.2.1 through E106.2.7.

E106.2.1 Group A. An *automatic sprinkler system* shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section.

E106.2.1.1 Group A-1. An *automatic sprinkler system* shall be provided for Group A-1 occupancies where one of the following conditions exists:

1. The *fire area* exceeds 6,000 square feet (557.5m²);
2. The *fire area* has an *occupant load* of 150 or more;
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies; or
4. The *fire area* contains a multitheater complex.

E106.2.1.2 Group A-2. An *automatic sprinkler system* shall be provided for Group A-2 occupancies where one of the following conditions exists:

1. The *fire area* exceeds 2,500 square feet (232.2m²);
2. The *fire area* has an *occupant load* of 50 or more; or
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

E106.2.1.3 Group A-3. An *automatic sprinkler system* shall be provided for Group A-3 occupancies where one of the following conditions exists:

1. The *fire area* exceeds 6,000 square feet (557.5m²);
2. The *fire area* has an *occupant load* of 150 or more; or
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

E106.2.1.4 Group A-4. An *automatic sprinkler system* shall be provided for Group A-4 occupancies where one of the following conditions exists:

1. The fire area exceeds 6,000 square feet (557.5m²);
2. The fire area has an occupant load of 150 or more; or
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

E106.2.2 Group E. An automatic sprinkler system shall be provided for Group E occupancies as provided in this section:

1. Throughout all Group E fire areas greater than 6,000 square feet (557.5 m²) in area.
2. Throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building.

Exception: An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has at least one exterior exit door at ground level.

E106.2.3 Group F-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

1. A Group F-1 fire area exceeds 6,000 square feet (557.5m²);
2. A Group F-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 12,000 square feet (1105m²).
4. A Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet (232 m²).

E106.2.3.1 Woodworking operations. An automatic sprinkler system shall be provided throughout all Group F-1 occupancy fire areas that contain woodworking operations in excess of 2,500 square feet (232 m²) in area which generate finely divided combustible waste or use finely divided combustible materials.

E106.2.4 Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M fire area exceeds 6,000 square feet (557.5m²);
2. A Group M fire area is located more than three stories above grade plane.
3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 12,000 square feet (1105m²).
4. A Group M occupancy used for the display and sale of upholstered furniture or mattresses exceeds 2,500 square feet (232m²).

E106.2.5 Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 fire area exceeds 6,000 square feet (557.5m²);
2. A Group S-1 fire area is located more than three stories above grade plane.
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 12,000 square feet (1105m²).
4. A Group S-1 fire area used for the storage of commercial trucks or buses where the fire area exceeds 2,500 square feet (232m²).
5. A Group S-1 occupancy used for the display and sale of upholstered furniture or mattresses exceeds 2,500 square feet (2326m²).

E106.2.5.1 Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406 of the *International Building Code*, as shown:

1. Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 5000 square feet (464 m²).
2. Buildings no more than one story above grade plane, with a fire area containing a repair garage exceeding 6,000 square feet (557.5m²).
3. Buildings with repair garages servicing vehicles parked in basements. 4. A Group S-1 fire area used for the repair of commercial trucks or buses where the fire area exceeds 2,500 square feet (232m²).
4. A Grp IJ S-1 fire area used for the repair of commercial trucks or buses where the fire area exceeds 2500 square feet (232m²).

E106.2.5.2 Bulk storage of tires. Buildings and structures where the area for the storage of tires exceeds 10,000 cubic feet (283m³) shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 of the *International Building Code*.

E106.2.6 Group S-2 enclosed parking garages. An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 Public parking garages of the *International Building Code* as follows:

1. Where the fire area of the enclosed parking garage exceeds 6,000 square feet (557.5m²); or
2. Where the enclosed parking garage is located beneath other groups.

Exception: Enclosed parking garages located beneath Group R-3 occupancies.

E106.2.7 Group B. An automatic sprinkler system shall be provided throughout buildings containing a Group B occupancy where one of the following conditions exists:

1. A Group B fire area exceeds 6,000 square feet (556 m²).
2. A Group B fire area is located more than three stories above grade plane.
3. The combined area of all Group B fire areas on all floors, including any mezzanines, exceeds 12,000 square feet (1,115 m²).

E106.3 Automatic Sprinkler Systems. Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1 NFPA 13 sprinkler systems of the *International Building Code*. Sprinkler systems designed and installed in accordance with Section 903.3.1.2 NFPA 13R sprinkler systems of the *International Building Code* shall not be permitted.

E106.4 Standpipes. Standpipes shall comply with the requirements of this Section.

E106.4.1[Add Section Title Here] The exception to Section 905.4.1, Protection of the *International Building Code* that allows elimination of the fire-resistance rated enclosure for laterals where automatic sprinkler systems are provided shall not be permitted.

E106.5 Fire Alarm and Detection Systems. Fire alarms and detection systems shall comply with the provisions of this Section.

E106.5.1 Manual pull station. The number of manual pull stations required in Section 907, Fire alarm and detection systems, of the *International Building Code* for fire alarm systems shall not be permitted to be reduced or eliminated where automatic sprinkler systems are provided.

SECTION E107
MEANS OF EGRESS

E107.1 General. In order to limit the impact of fires on the *building* the *building* shall comply with Sections E107.1 through E107.7 and the requirements for Chapter 10 Means of Egress of the *International Building Code*.

E107.2 Means of egress capacity factor. The means of egress capacity factor used for calculating the egress capacity for stairways in Section 1005.3.1 Stairways of the *International Building Code* shall be 0.3 inch (7.6 mm) per occupant with no reduction for automatic sprinkler protection in the building. The means of egress capacity factor used for calculating the egress capacity for other egress components in Section 1005.3.2 Other egress components of the *International Building Code* shall be 0.2 inch (5.1 mm) per occupant with no reduction for automatic sprinkler protection in the building.

E107.3. Accessible means of egress. Accessible means of egress shall comply with the requirements of this Section.

E107.3.1 Exception 2 of Section 1007.3, Stairways, of the *International Building Code* that reduces in the clear width between handrails shall not be permitted.

E107.3.2[Add Section Title Here] Exception 3 of Section 1007.3, Stairways, of the *International Building Code* that eliminates areas of refuge shall not be permitted.

E107.3.3[Add Section Title Here] Exception 2 of Section 1007.4, Elevators, of the *International Building Code* that eliminates requirements for elevator access from areas of refuge or horizontal exit shall not be permitted.

E107.4 Stairways. The exception for Section 1007.7.4 Stairways, of the *International Building Code* that reduces in the clear width between handrails shall not be permitted.

E107.5 Exit access. The common path of travel shall comply with the requirements in Table E107 (1). Table E107 (1) shall be used in lieu of Table 1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY in the *International Building Code*.

Table E107(1)
Spaces With One Exit or One Exit Access Doorway

<u>OCCUPANCY</u>	<u>MAXIMUM OCCUPANT LOAD OF SPACE</u>	<u>MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)</u>	
		<u>OCCUPANT LOAD</u>	
		<u>OL < 30</u>	<u>OL > = 30</u>
<u>A, E, M</u>	<u>49</u>	<u>75</u>	<u>75</u>
<u>B</u>	<u>49</u>	<u>100</u>	<u>75</u>
<u>F</u>	<u>49</u>	<u>75</u>	<u>75</u>
<u>H-1, H-2, H-3</u>	<u>3</u>	<u>25</u>	<u>25</u>
<u>H-4, H-5, I-1, I-2, I-4, R-1, R-3, R-4</u>	<u>10</u>	<u>75</u>	<u>75</u>
<u>I-3</u>	<u>10</u>	<u>100</u>	<u>100</u>
<u>R-2</u>	<u>10</u>	<u>125</u>	<u>125</u>
<u>R-3</u>	<u>10</u>	<u>125</u>	<u>125</u>
<u>S</u>	<u>29</u>	<u>100</u>	<u>75</u>
<u>U</u>	<u>49</u>	<u>100</u>	<u>75</u>

For SI: 1 foot = 304.8 mm

E107.6 Exits and exit access doorways. Exits and exit access doorways shall comply with the requirements of this Section.

E107.6.1[Add Section Title Here] Exception 1 in Section 1016.2.1, Egress based on occupant load and common path of egress travel, of the *International Building Code* that reduces the number of means of egress shall not be permitted.

E107.6.2[Add Section Title Here] Exception 1 of Section 1007.1.1, Two exits or exit access doorways, of the *International Building Code* that counts scissor stairs as two exits shall not be permitted.

E107.7 Exit access travel distance. Exit access travel distance shall comply with the requirements in Table E107 (2) and this Section. Table E107 (2) shall be used in lieu of Table 1016.2 EXIT ACCESS TRAVEL DISTANCE in the *International Building Code*.

Table E107(2)
Exit Access Travel Distance

<u>OCCUPANCY</u>	<u>DISTANCE (ft)</u>
A, E, F-1, M, R, S-1	<u>200</u>
I-1, I-2	<u>200</u>
B	<u>200</u>
F-2, S-2, U	<u>300</u>
H-1	<u>75</u>
H-2	<u>100</u>
H-3	<u>150</u>
H-4	<u>175</u>
H-5	<u>200</u>
I-3, I-4	<u>150</u>

- a. See the following sections of the *International Building Code* for modifications to exit access travel distance requirements:
- Section 402.8: For the distance limitation in *malls*.
 - Section 404.9: For the distance limitation through an *atrium* space.
 - Section 407.4: For the distance limitation in Group I-2.
 - Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
 - Section 411.4: For the distance limitation in special amusement buildings.
 - Section 1006.2.2.2: For the distance limitation in refrigeration machinery rooms.
 - Section 1006.2.2.3: For the distance limitation in refrigerated rooms and spaces.
 - Section 1006.3.3 For buildings with one exit.
 - Section 1028.7: Increased distance limitation shall only apply to smoke-protected and open-air assembly seating.
 - Section 3103.4: For temporary structures.
 - Section 3104.9: Increased distance limitation shall only apply to pedestrian walkways in accordance with Exception No. 2.

E107.7.1[Add Section Title Here] Distance limitations through atrium spaces shall conform to Section 404, Atriums of the *International Building Code*.

E107.7.2[Add Section Title Here] Exit access in buildings with one exit shall conform to Section 1006.3.3, Single exits of the *International Building Code*

E107.8 Corridors. Corridors shall comply with the requirements of this Section.

E107.8.1[Add Section Title Here] The fire-resistance rating of corridor walls shall be at least 1-hour.

E107.8.2[Add Section Title Here] Exception 2 in Section 1019.4, Dead ends, of the *International Building Code* that increases the length of dead-end corridors shall not be permitted.

SECTION E108

EXTERIOR WALLS

E108.1 General. Exterior wall coverings shall comply with Sections E108.2 through E108.4 and the requirements for Exterior Walls in Chapter 14 and Plastics in Chapter 26 of the International Building Code.

E108.2 Exterior wall covering limitations for reduced damage from fire. Exterior wall coverings shall comply with E108.2.1 and E108.2.2 to reduce damage from fire exposure.

Exception. These criteria shall not apply where Sections 1406.2.1 through 1406.2.3 of the *International Building Code* are satisfied.

E108.2.1 Vinyl siding and Exterior insulation and finish systems (EIFS). Vinyl siding and Exterior insulation and finish systems (EIFS) shall only be permitted to be installed on exterior walls of buildings with a minimum fire separation distance of 30 feet.

E108.2.2 Fire Separation 5 Feet or Less. Combustible exterior wall coverings are not permitted on exterior walls having a fire separation distance of 5 feet (1524 mm) or less.

E108.3 Exterior wall covering limitations for reduced damage from hail. Vinyl siding and Exterior insulation and finish systems (EIFS) shall comply with sections E108.3.1 and E108.3.2.

E108.3.1 Hail Exposure regions. Hail exposure regions in Figure E108 (1) shall be as follows:

(a) Moderate - One or more hail days with hail diameters greater than 1.5 in (38 mm) in a twenty (20) year period.

(b) Severe - One or more hail days with hail diameters greater than 2.0 in (50 mm) in a twenty (20) year period.

E108.3.2 Exterior wall coverings subject to hail exposure. Wall coverings used in regions where hail exposure is Moderate or Severe, as determined in accordance with Section E108.3.1 and Figure E108 (1), shall be tested, classified, and labeled in accordance with UL 2218 or FM 4473.

E108.4 Exterior wall covering limitations for reduced damage from wind. Vinyl siding and Exterior insulation and finish systems (EIFS) shall only be permitted to be installed on exterior walls of buildings located as follows:

1. Regardless of the Risk Category, in areas where V_{ult} as determined in accordance with Figure 1609A does not exceed 115 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C.
2. Regardless of the Risk Category, in areas where V_{ult} as determined in accordance with Figure 1609A exceeds 115 miles per hour (45 m/s) or the building height is equal to 40 feet (12192 mm) or greater in Exposure C, vinyl siding shall be permitted on exterior walls when tested in accordance with ASTM D5206 using wind speed not less than the wind speed applicable for the building location.

SECTION E109 **ROOF ASSEMBLIES**

E109.1 General. Roof coverings shall also comply with Sections E109.2 through E109.4 and the requirements for Chapter 15 Roof Assemblies and Rooftop Structures of the *International Building Code*.

E109.2 Non-classified roofs. Non-classified roof coverings in accordance with Section 1505.5 Non-classified roofing of the International Building Code shall not be permitted on buildings.

E109.3 Roofs in Warm and Dry Climates. Roofs in climate zones 1, 2, 3, 4, 5B (dry), and 6B (dry) of the *International Energy Conservation Code (IECC)* shall have a Class A roof covering or Class A roof assembly according to ASTM E108 or UL 790. For roof coverings where the profile allows a space between the roof covering and roof decking, the space at the eave ends shall be firestopped to preclude entry of flames or embers.

E109.4 Roof coverings subject to hail exposure. Roof coverings used in regions where hail exposure is Moderate or Severe, as determined in accordance with Section E109.4.1 and Figure E108 (1), shall be tested, classified, and labeled in accordance with UL 2218 or FM 4473.

E109.4.1[Add Section Title Here] Hail Exposure regions in Figure E108 (1) shall be as follows:

- (a) Moderate** - One or more hail days with hail diameters greater than 1.5 in (3 mm) in a twenty (20) year period.
- (b) Severe** - One or more hail days with hail diameters greater than 2.0 in (50 mm) in a twenty (20) year period.

SECTION E110
STRUCTURAL

E110.1 General. In order to limit the impact of loads from snow, wind, floods and earthquakes on the *building* the *building* shall comply with Sections E110.1 through E110.7 and the requirements for Chapter 4 Special Detailed Requirements Based on Use And Occupancy and Chapter 16 Structural Design of the *International Building Code*.

E110.2 Importance factors by risk category. The minimum design loads for buildings shall be based on the Importance Factors in Table E110 (1).

Table E110(1)
Importance Factors by Risk Category

<u>Risk Category from Table 1604.5 in the IBC</u>	<u>Snow Importance Factor, I_s</u>	<u>Ice Importance Factor, I_i</u>	<u>Wind Importance Factor, I_w</u>	<u>Seismic Importance Factor I_g 0.2 Spectral Response</u>	
				<u>$\leq 0.40 g$</u>	<u>$> 0.40 g$</u>
I	0.95	0.95	1.20	1.00	1.20
II	1.20	1.20	1.20	1.00	1.20
III	1.25	1.40	1.15	1.25	1.40
IV	1.30	1.40	1.15	1.50	1.65

E110.3 Snowloads. In order to limit the impact of snow on the *building* the Snow Load Importance Factor, I_s , shall be determined from Table E110 (1).

E110.4 Wind loads. In order to limit the impact of wind on the *building* the Wind Load Importance Factor, I_w , shall be determined from Table E110 (1). Component and cladding loads shall be

determined for the design wind speed determined in accordance with Section 1609.1.1 Determination of wind loads of the *International Building Code* and defined assuming terrain Exposure C regardless of the actual local exposure.

E110.5 Flood loads. Buildings designed and constructed in flood hazard areas defined in Section 1612.2 Definitions of the *International Building Code* shall comply with the following.

E110.5.1 Floors above base flood elevation. Floors required by ASCE 24 to be built above base flood elevations shall have the floor and their lowest horizontal supporting member not less than the higher of the following:

1. Design flood elevation.
2. Base flood elevation plus 3 feet, or
3. Advisory base flood elevation plus 3 feet, or
4. 500-year flood, if known

E110.5.2 Flood protective works. Buildings designed and constructed in accordance with ASCE 24 shall not consider levees or floodwalls for providing flood protection during the design flood.

E110.5.3 Protection of mechanical, plumbing and electrical systems. Mechanical, plumbing and electrical systems, including plumbing fixtures and utility connections, shall comply with the following:

1. All components shall be elevated above the design flood elevation.

Exception: Electrical systems, equipment and components, and heating, ventilating, air conditioning, and plumbing appliances, plumbing fixtures, duct systems and other service equipment shall be permitted to be located below the design flood elevation provided that all elements are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy. Electrical wiring systems shall be permitted to be located below the design flood elevation provided they conform to the provisions of NFPA70.

2. Where break away wall systems are required, vertical runs extending below the lowest habitable floor shall be protected by columns or other structural elements that are not part of any break away wall system and shall not be connected to any break away elements.

E110.6 Earthquake loads. In order to limit the impact of seismic events on the building the Seismic Load Importance Factor, I_e , shall be determined from Table E110 (1). The building shall also comply with Sections E110.6.1 and E110.6.2.

E110.6.1 Near fault sites. Buildings are not permitted on sites where the ground surface has the known potential to rupture at the structure due to ground motion. Determination shall be based on fault zones (areas subject to severe ground dislocations) that have been established and mapped.

E110.6.2 Seismic Design Categories C, D, E and F. Where the seismic design category is determined to be C, D, E or F in accordance with Section 1613.3.5 Determination of seismic design category of the *International Building Code*, the building shall be designed by a registered design professional.

E110.7 Atmospheric ice loads. In order to limit the impact of atmospheric ice load events on the building the ice- importance factor, I_i , shall be determined from Table E110 (1).

E110.8 Storm Shelters. Buildings and structures shall be provided with storm shelters conforming to the requirements of Section 423 of the International Building Code where required by Section E110.8.1.

E110.8.1 Storm shelters required. Storm shelters shall be provided for occupants of buildings in accordance with Sections E110.8.1.1, E110.8.1.2 and E110.8.2.3.

Exceptions:

1. Buildings meeting the requirements for shelter design in ICC/NSSA 500.
2. Where storm shelters within 1/4-mile of the proposed building are available and have adequate size to accommodate the added occupant load of the proposed building.
3. Where the code official determines the building size, location or occupant load does not warrant shelters.

E110.8.1.1 Hurricane areas. Buildings in hurricane-prone regions assigned to Group A-3 (community halls, schools and libraries), B (civic administration), E, I-1, I-2, I-3, M, R and buildings assigned to Occupancy Categories III and IV in accordance with Section 1604.5 Risk category of the International Building Code.

E110.8.1.2 Tornado areas. Buildings assigned to Group A-3 (community halls, schools and libraries), B (civic administration), E, I-1, I-2, I-3, M, R and buildings assigned to Occupancy Categories III and IV in accordance with Section 1604.5 Risk category of the International Building Code in areas where the shelter design wind speed for tornadoes of Figure 304.2(1) of ICC/NSSA 500 is 250 mph.

E110.8.1.3 Combined hurricane and tornado shelters. Where combined hurricane and tornado shelters are provided the shelter shall comply with the more stringent requirements of ICC/NSSA-500 for both types of shelters.

E110.9 Wildland. In order to limit the impact of wildland fires on the building the building shall comply with Sections E110.9.1 through E110.9.3

E110.9.1 Wildland Fires. The provisions of the International Code Council (ICC) International Wildland-Urban Interface Code shall apply to the construction, alteration, movement, repair, maintenance and use of any building, structure or premises within the wildland interface areas in this jurisdiction.

E110.9.2 Exterior walls. Exterior wall requirements shall be based on the Fire Hazard Severity specified in Table 502.1 FIRE HAZARD SEVERITY in the International Wildland-Urban Interface Code.

E110.9.3 Smoke Detection. An automatic smoke detection system shall be installed throughout buildings located within areas designated by the jurisdiction as being a wild land urban interface area.

E111
REFERENCED STANDARDS

American Society of Civil Engineers
Structural Engineers Institute

ASCE/SEI
1801 Alexander Bell Drive
Reston, VA 20191-4400

24-13 Flood Resistant Design and Construction

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

ASTM

E108-11 Standard Test Methods for Fire Tests of Roof Coverings
D4226-11 Standard Test Methods for Impact Resistance of Rigid Poly(Vinyl Chloride) (PVC) Building Products
D5206-13 Standard Test Method for Windload Resistance of Rigid Plastic Siding
-

Factory Mutual Global Research
Standards Laboratories Department
1301 Atwood Avenue, P.O. Box 7500
Johnston, RI 02919

FM

FM 4473-11 Specification Test Standard for Impact Resistance Testing of Rigid Roof Materials by Impacting With Freezer Ice Balls

International Code Council, Inc.
500 New Jersey Ave. NW
6th Floor
Washington, DC 20001

ICC

IBC – 15 International Building Code® E102, E103, E104, E105, E106, E107, E108, E109, E110

IECC – 15 International Energy Conservation Code®
IWUC – 15 International Wildland-Urban Interface Code®
ICC 500-14 ICC/NSSA Standard on the Design and Construction of Storm Shelters

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269

NFPA 13-13 Standard for the Installation of Sprinkler Systems
Standard for the Installation of Sprinkler Systems in -
NFPA 13R-13 Residential Occupancies Up to and Including Four -
Stories in Height -
NFPA 70-11 National Electrical Code -

UL

Underwriters Laboratories Inc.
333 Pfingsten Road
Northbrook, IL 60062

UL 790-04 Standard Test Methods for Fire Tests of Roof Coverings – with revisions through October 2008

UL 2218-10 Impact Resistance of Prepared Roof Covering Materials

Reason: This reason statement has the following four segments to explain the reasons for this change: (A) Background on these criteria with regard to the ICC code development process; (B) Substantiation for sustainability through enhanced resilience; (C) Additional life safety benefits for occupants through enhanced resilience and (D) General background information identifying the need for enhanced property protection and functional resilience to strengthen the built environment.

(A)

Similar criteria were submitted as proposed mandatory provisions of the 2012 edition of the International Building Code. Committee members identified these types of criteria as having merit but recommended that they be proposed to the International Building Code. Proposals were submitted as mandatory requirements within the body of the International Building Code and also as an optional appendix. Both approached where disapproved for the International Building Code as not being minimum requirements for general construction. Committee members suggested that these types of criteria be addressed in the International Green Construction Code. Thus these criteria are being presented as an optional appendix to the International Green Construction code.

It is noteworthy that state and local jurisdictions are considering criteria for enhanced resilience in their general building code, superseding the criteria of the I-Codes. For example the State of Georgia, under a U.S. Department of Housing and Urban

Development grant and adopted an optional appendix to their statewide code to permit jurisdictions to adopt and enforce criteria for enhanced resiliency. Many jurisdictions like Lake County Illinois have adopted flood criteria that is more stringent than the criteria in the I-Codes. As jurisdictions are adopting more stringent criteria for all buildings, criteria for enhanced resilience should be a prerequisite for all green or sustainable buildings to provide acceptable levels of longevity, durability, robustness, improved life safety, ease of adaptability for reuse as well as resistance to disasters. Such provisions will reduce time and resources for disaster response and recovery as well as helping to assure community continuity by better maintaining revenues and places for employment and to house employees.

The sustainability benefits of enhanced resiliency in building design and construction are not limited to the general continuity and welfare of communities but also have a significant role to minimize negative environmental impacts should disasters occur. The U.S. Army Corps of engineers reported that 44 million cubic yard of building materials and contents were disposed of in land following Hurricane Katrina. Most of the materials were not salvageable because they were contaminated. This is the equivalent of laying 21 cubic foot refrigerators end to end twice around the equator. Provisions for enhanced resiliency such as elevating habitable spaces above a specific natural flood elevation can significantly minimize the amount of materials disposed because they are damaged and contaminated. Reports after the tornado strike in Moore, Oklahoma advised that is placed on a single debris pile the pile of debris would have been more than a mile high. More resilient construction would clearly minimize the amount of damage, may not from a direct path of the funnel of an EF5 tornado, but at least for the lower perimeter wind forces and flying debris.

(B)

The following are reports of dollar loss to property from wind, cold weather and fire disasters.

- The American Society of Civil Engineers reported in *Normalized Hurricane Damage in the United States, 1900 – 2005*, National Hazard Review, ASCE 2008, that property damage from hurricanes was 81 billion dollars in 2005.
- The National Weather Service reports that U.S. property damage due to winter storms and ice exceeded 1.5 billion dollars in 2009.
- *Fire Losses in the United States During 2009* by the National Fire Protection Association, August 2010 shows that property loss due to structure fires in buildings other than one and two family dwellings was approximately 4.5 billion dollars.

Increasing the stringency of the design criteria of buildings for hazards such as wind, snow or fire results in more robust buildings. Such requirements reduce the amount of energy and resources required for repair, removal, disposal and replacement of building components and systems damaged from these disasters. A further benefit is a reduction in the amount of damaged building materials and content entering landfills.

While there has not been a proportionate increase in either frequency of events (which have remained relatively constant) construction put in place (which has maintained an upward trend of trend of 10% per decade or 40% over last four decades) or demographics (population growth even in the fastest growing regions has 10% per decade or 40% over the same time period) property losses due to natural disasters, adjusted to 2010 dollars, have increased by over a staggering 3500%, see Figure 1. Losses from fire, adjusted to 2010 dollars, have increased by 85% per fire, see Figure 2.

Figure 1 Increase in Property Losses Due to Natural Disasters, excluding Flood¹

Flood losses not collected by private insurance companies

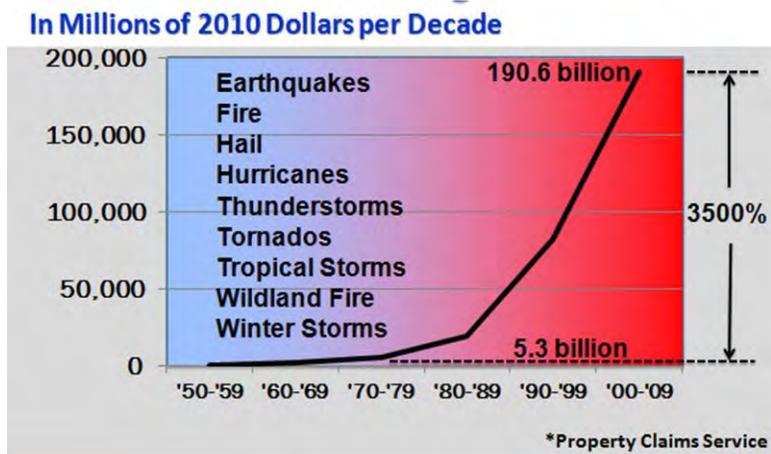
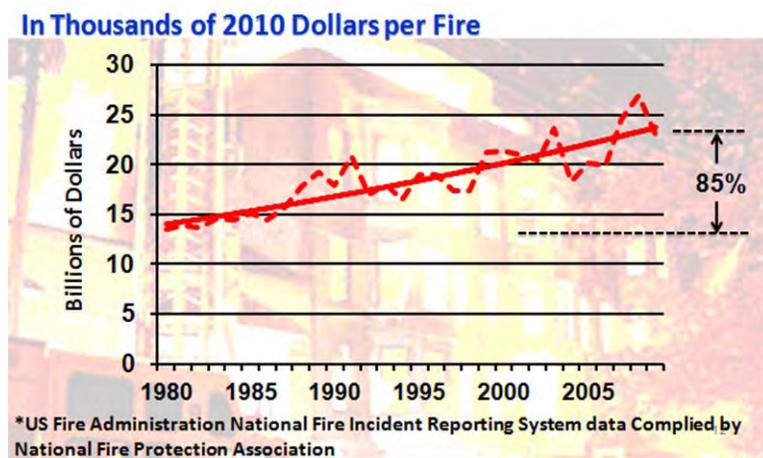


Figure 2 Increase in Fire Losses Per Structure Fire



These specific requirements help reduce commonly occurring property losses.
Flooding:



Hurricanes:



Source: U.S. Navy photo by
Chief Petty Officer Johnny Bivera

Katrina Aftermath
Seismic Events:

Source: Federal Emergency Management Agency



Earthquake damage to personal property.

Snow loads:



Source – Institute for Business and Home Safety

In many instances roof collapse due to snow loads not only results in damage to roof and building contents below but may also remove lateral support, allowing walls to collapse.

Wind:



Source: Federal Emergency Management Agency, photograph taken by Lara Shane of FEMA.

Homes and businesses that are not designed and constructed to provide an appropriate level of resilience are at greater risk in high wind exposures.

Tornadoes:



Source: Oklahoma Department of Emergency Management

Storm shelters and safe rooms really work

Structure Fires:



Source: Northeast Fire Safety Construction Advisory Council

Fire containment achieved with compartmentation minimizes damage due to fire, smoke and water used for suppression.

External fire Exposure:



Source: Brick Institute of America Region 9.

Siding on a building nearly 100 feet away from a burning building needs to be replaced.

Wildland Fires and Conflagrations after Disasters:



Source: Federal Emergency Management Agency



Topography, vegetative fuels and drought contribute to the potential for devastating wildfires

Wind Damage – Attachment

Source – Portland Cement Association – photo by Steve Skalko

Damage to siding and sheathing as a result of high winds

Wind Damage - System Failure



Source – Institute for Business & Home Safety

Wind damage to lightweight exterior wall covering.

Hail impact: Horizontal Surfaces



Source: National Oceanic and Atmospheric Administration, National Weather Service.

Roof shingles need to be removed, disposed and replaced due to hail damage

Hail Impact: Vertical Surfaces



Source National Oceanic and Atmospheric Administration, National Weather Service

Siding needs to be removed, disposed and replaced due to hail damage.

Rodentproofing:



Source: Image provided with permission from Alternative Building Services:
www.altbuildingservices.com.

Building elements in need of repair due to rodent damage. Undetected damage can compromise the integrity of the building thermal envelope and moisture protection.

Further benefits are enhanced security and occupant comfort; potentially less demand on community resources required for emergency response; and allowing facilities to be more readily adapted for re-use if there is a change of occupancy in the future.

(C)

The 1987 landmark report "America Burning" (Report of the National Commission on Fire Prevention and Control) recommended the increased use of automatic sprinkler systems, and the sprinkler trade-off concept as a financial incentive to encourage the installation of sprinklers in buildings to enhance life safety to the benefit of the building occupants. Automatic fire sprinklers designed for the intended fire load that are installed correctly and maintained to operate with adequate water supply are undoubtedly have contributed significantly to reduced loss of life and reduced property damage. However, for the last two decades hundreds of sprinkler trade-offs have been incorporated into model building codes such as the International Building Code that drastically reduce built-in fire protection when sprinklers are present. The result is considerably less fire safety layers in a building and significant reliance only on the sprinkler system for occupant safety.

There is increasing concern about the reduction or complete elimination of fire rated assemblies based on reliance of automatic sprinklers. To address this concern this proposal removes many of the sprinkler trade-offs in order to encourage increase fire safety and resilience of buildings through a combination of fire resistant construction and sprinklers protection.

Too, natural disasters such earthquakes, hurricanes and floods disrupt water supplies and power to buildings adversely affecting the life safety systems such as sprinkler protection and fire alarm systems. These events also damage gas mains serving buildings resulting in gas leaks and increased fire incidents. Without the fire safety layers of sprinklers and fire alarms, the building will not be able to withstand as big of a fire and will fail sooner, putting occupants and especially firefighters at great risk. This proposal encourages enhanced resilience to these natural disasters to reduce fire safety risk to the occupants.

It has been widely accepted that when buildings are constructed with an appropriate combination of active and passive fire protection using the concept of fire safety layering, they are more resilient and better able to ensure continuity of operations, improved sustainability, increased durability, increased adaptability for reuse, increased resistance to disasters, and improved life safety for occupants and firefighters.

(D)

Minimum building requirements whether through energy codes, plumbing codes, mechanical codes, zoning codes, or basic building codes, do not encourage truly sustainable buildings. The proposal attempts to integrate the concepts of the *Whole Building Design Guide* (WBDG) into the International Building Code as a non-mandatory Appendix. This allows adopting jurisdictions the option of incorporating code requirements into the building code to improve the resilience of the built environment without the need to add another code to the community requirements.

The WBDG, developed in partnership between the National Institute of Building Sciences (NIBS) and the Sustainable Building Industries Council (SBIC), has as its key concepts: accessible, aesthetics, cost-effective, functional/operational, historic preservation, productive, secure/safe, and sustainable.

There are numerous references about the economic, societal, and environmental benefits that result when enhanced functional resilience for resource minimization are integrated into building design and construction. Six examples demonstrating the importance and supporting the concepts are:

Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities

National Institute of Building Sciences Multi-Hazard Mitigation Council - 2005

One of the findings in this report is "The analysis of the statistically representative sample of FEMA grants awarded during the study period indicates that a dollar spent on disaster mitigation saves society an average of \$4." The programs studied often addressed issues and strategies other than enhanced disaster resistance of buildings and other structures. However, more disaster-resistant buildings enhance life safety; reduce costs and environmental impacts associated with repair, removal, disposal, and replacement; and reduce the time and resources required for community recovery.

2. Five Years Later – Are we better prepared?

Institute for Business and Home Safety - 2010

This IBHS report states: "When Hurricane Katrina made landfall on Aug. 29, 2005, it caused an estimated \$41.1 billion in insured losses across six states, and took an incalculable economic and social toll on many communities. Five years later, the recovery continues and some residents in the most severely affected states of Alabama, Louisiana and Mississippi are still struggling. There is no question that no one wants a repeat performance of this devastating event that left at least 1,300 people dead. Yet, the steps taken to improve the quality of the building stock, whether through rebuilding or new construction, call into question the commitment of some key stakeholders to ensuring that past mistakes are not repeated." This report indicates that there is a need to implement provisions to make buildings more disaster-resistant. Clearly this suggests that functional resilience should at least be integrated into the design and construction of sustainable buildings.

3. National Weather Service Office of Climate, Water and Weather Services

National Oceanic and Atmospheric Administration (NOAA) - 2010

Data provided on the NOAA website [www.weather.gov/os/hazstats.shtml] indicates that the average annual direct property loss due to natural disasters in the United States exceeds of \$35,000,000,000. This does not include indirect costs associated with loss of residences, business closures, and resources expended for emergency response and management. These direct property losses also do not reflect the direct environmental impact due to reconstruction after the disasters. Functional resilience will help alleviate the environmental impact and minimize both direct and indirect losses from natural disasters.

4. Global Climate Change Impacts in the United States

U.S. Global Change Research Program (USGCRP)- 2009

The USGCRP includes the departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Interior, State and Transportation; National Aeronautic and Space Administration; Environmental Protection Agency, USA International Development, National Science Foundation and Smithsonian Institution

The report identifies that: "Climate changes are underway in the United States and are projected to grow. Climate-related changes are already observed in the United States and its coastal waters. These include increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening growing seasons, lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows. These changes are projected to grow." The report further identifies that the: "Threats to human health will increase. Health impacts of climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. Robust public health infrastructure can reduce the potential for negative impacts." Key messages in the report on societal impacts include:

- City residents and city infrastructure have unique vulnerabilities to climate change. "
- Climate change affects communities through changes in climate-sensitive resources that occur both locally and at great distances."
- Insurance is one of the industries particularly vulnerable to increasing extreme weather events such as severe storms, but it can also help society manage the risks."

Sustainable building design and construction cannot be about protecting the natural environment without consideration of the projected growth in severe weather. Minimum codes primarily based on past natural events

are not appropriate for truly sustainable buildings. Buildings expected to have long term positive impacts on the environment must be protected from these extreme changes in the natural environment. The provisions for improved property protections are necessary to reduce the amount of energy and resources associated with repair, removal, disposal, and replacement due to routine maintenance and damage from disasters. Further such provisions reduce the time and resources required for community disaster recovery.

5. **Sustainable Stewardship** - *Historic preservation plays an essential role in fighting climate change* ,

Traditional Building, National Trust for Historic Preservation - 2008

In the article Richard Moe summarizes the results of a study by the Brookings Institution which projects that by 2030 we will have demolished and replaced 82 billion square feet of our current building stock, or nearly 1/3 of our existing buildings, largely because the vast majority of them weren't designed and built to last any longer. Durability, as a component of functional resilience, can reduce these losses.

6. **Opportunities for Integrating Disaster Mitigation and Energy Retrofit Programs**

Senate Environment and Public Works Committee Room, Dirksen Senate Office Building, Washington, D.C. - 2010

During this panel discussion a representative of the National Conference of State Historic Preservation Officers noted that more robust buildings erected prior to 1950 tend to be more adaptable for reuse and renovation. Prior to the mid-1950s most local jurisdictions developed their own building code requirements that uniquely addressed the community's needs, issues and concerns. Pre-1950 building codes typically resulted in more durable and robust construction that lasts longer.

The total environmental impact of insulation, high efficiency equipment, components, and appliances, low-flow plumbing fixtures, and other building materials and contents are relatively insignificant when rendered irreparable or contaminated and must be disposed of in landfills after disasters. The US Army Corps of Engineers estimated that after Hurricane Katrina nearly 1.2 billion cubic feet of building materials and contents ended up in landfills. This is analogous to stacking enough refrigerators a fifth of the way to the moon or placing them end to end around the equator of the Earth twice.

Cost Impact: Will increase the cost of construction

GG338-14 : APPENDIX E (NEW)-SKALKO909

GG339-14

Appendix R (New)

Proponent: Tien Peng, National Ready Mixed Concrete Association, representing National Ready Mixed Concrete (tpeng@nrmca.org); Stephen Szoke, Portland Cement Association, representing Portland Cement Association (sszoke@cement.org)

Add new text as follows:

APPENDIX R

RESILIENT DESIGN AND CONSTRUCTION

The provisions in this appendix are not mandatory unless specifically mandated under Section 302 Jurisdictional Requirements. If indicated, the provisions of this appendix are intended to be used in conjunction with the requirements of the International Building Code and requires design strategies that reduce the environmental impact of the building due to repair and retrofit resulting from hazard events including fires, earthquakes, hurricanes, tornadoes, floods, hail, snow and other natural or man-made hazards.

R101.1 Purpose. Improve public safety and disaster resilience by designing the project building to resist hazards above the minimum requirements in the International Building Code including fire, snow, wind, floods, earthquake, hail and other natural or man-made hazards to reduce the environmental impacts associated with extracting, processing, transporting and installing materials for repairing, replacing and/or retrofitting a building after a disaster. The requirements for this section shall be performed in accordance with Section R101.2.

R101.2 Requirements. Demonstrate reduced environmental impacts from disaster resilient design for natural and man-made hazards through whole-building life cycle assessment of the project building. To meet the requirement, two building designs shall be completed, a reference building and project building, and life cycle assessment performed on each building. The reference building shall be designed to the minimum requirements of this code and the minimum loads and hazards of the International Building Code and the project building shall be designed to a higher level of loads and hazards. Taking into account the probability of the buildings being subjected to project building loads and hazards over a 75-year life of the buildings, estimate damage to the buildings and the environmental impact of repairing, replacing and retrofitting the buildings and include these impacts in the life cycle assessment.

1. The life cycle assessment shall demonstrate that the building project achieves not less than a 5-percent improvement in environmental performance for global warming potential and at least two of the following impact measures, as compared to a reference design of similar usable floor area, function, materials and configuration that meets the minimum requirements of this code and the requirements of the International Building Code.
 - 1.1. Acidification potential.
 - 1.2. Eutrophication potential.
 - 1.3. Ozone depletion potential.
 - 1.4. Smog potential.
 - 1.5. Depletion of non-renewable energy resources.
 - 1.6. Depletion of non-renewable material resources.
 - 1.7. Use of renewable material resource.
 - 1.8. Use of renewable primary energy.
 - 1.9. Consumption of freshwater.
 - 1.10. Hazardous waste.
 - 1.11. Non-hazardous waste.
 - 1.12. Impact(s) and potential impact(s) on biodiversity.

1.13. Toxicity related to human health, the environment or both.

2. The reference and project buildings shall utilize the same life cycle assessment tool.
3. The life cycle assessment tool shall be approved by the code official.
4. Building operational energy shall be included.
5. Building process loads shall be permitted to be included.
6. Maintenance and replacement schedules and actions for components shall be included in the assessment.
7. The full life cycle, from resource extraction to demolition and disposal, including but not limited to, onsite construction, maintenance and replacement, relocation and reconfiguration, and material and product embodied acquisition, process and transportation energy, shall be assessed.
8. The complete building envelope, structural elements, inclusive of footings and foundations, and interior walls, floors and ceilings, including interior and exterior finishes, shall be assessed to the extent that data are available for the materials being analyzed in the selected life cycle assessment tool.
9. The life cycle assessment shall conform to the requirements of ISO 14044.

Reason: The consequences of natural disasters have become increasingly real, personal and devastating. In 2012, there were 11 natural disasters costing \$1 billion or more in damage, making 2012 the second highest year with billion-dollar disasters^[i]. Early season tornadoes, the widespread and intense drought that covered at least 60 percent of the contiguous U.S. and Hurricane Sandy are expected to go down in history as the most costly weather-related disasters in U.S. history. Now, with the world's attention on the Philippines after Typhoon Haiyan, communities must rethink the way we build to meet the challenge of natural or man-made disasters.

Globally, insurers lost at least \$108 billion on disasters in 2011 and \$77 billion in 2012^[ii]. Reinsurer Swiss Re Ltd. said that 2011 was the second-worst year in the insurance industry's history. Only 2005, with Hurricane Katrina and other major storms, were more costly^[iii]. However, most of the increased disaster losses cannot be attributed to an increased occurrence of hazards but with changes in population migration and wealth. Frequency of major US hurricane landfalls has remained constant in the last 60 years^[iv], and the trend of strong to violent tornadoes (F3+) has, in fact, decreased since 1954^[v]. So what cause is attributed to the increase in losses?

In the last several decades, population in the United States has increased and migrated toward the coasts, concentrating along the earthquake-prone Pacific coast and the hurricane-prone Atlantic and Gulf coasts. Over 60% of the U.S. population lives within 50 miles of one of its coasts (including the Great Lakes)^[vi]. At the same time, wealth and the value of their possessions have increased substantially. For example, while California's Los Angeles County accounts for only 2.5% and Florida's Dale County account for only 14% of their respective states land area, yet they contain 30% of their state's property value^[vii]. These changes in concentration of population and property values are significant contributors to the increased property losses from natural hazards. Moreover, many elements of our aged infrastructure are highly vulnerable to breakdowns that can be triggered by relatively minor events^[viii].

Disasters result not as much from the destructive agent itself but from the way in which communities are (or are not) prepared. Disasters happen when the natural systems are encroached upon by human development. There is no such thing as a natural disaster. The extent of disruption caused by a disaster is greatly influenced by the degree to which society chooses be fortified for the event.

Buildings, when designed to minimum code requirements, are intended to experience controlled damage and provide minimum life safety. Therefore even if the building must be demolished or significantly repaired after a major earthquake, hurricane, tornado, fire or flood, it has met the intent of the code. For projects in high-risk areas, this minimal level of performance results in significant additional material impacts following a major natural or man-made event.

The term 'sustainability' usually describes some aspect of maintaining our resources from the environment to the quality of life, over time. It can also refer to the ability to tolerate—and overcome—degradation of natural environmental services, diminished productivity and reduced quality of life inflicted by human's relationships to the planet and each other.

Critical infrastructures and other essential services have enabled societies to thrive and grow and become increasingly interconnected and interdependent from the local to global levels. As a society, we have placed a great deal of emphasis on recycling rates and carbon footprints. It is ironic that we are surprisingly willing to invest considerable amounts of upfront capital for a building that achieves a modest savings in energy efficiency, yet we are completely satisfied if the structure meets only the code minimum requirements for seismic or wind load and is significantly damaged during these events.

A sustainable building should be designed to sustain minimal damage due to natural disasters such as hurricanes, tornadoes, earthquakes, flooding and fire. Otherwise, the environmental, economic and societal burden of our built environment could be overwhelming. A building that requires frequent repair and maintenance or complete replacement after disasters would result in unnecessary cost, from both private and public sources, and environmental burdens including the energy, waste and emissions due to disposal, repair and replacement. It doesn't make sense to design a modern building, commercial or residential, to meet the green code requirements that could be easily destroyed as a result of a hurricane, earthquake or other force of nature. That would mean that

all of the green technology and strategies used in the building would go to the landfill. What is the point of installing low flush toilets in a home to conserve water if it ends up in a landfill after a tornado blows through? Therefore, this proposal provides a performance pathway to demonstrate the environmental impact reduction through resilient design and construction. To meet the requirements of this section, the two designs shall be documented in separate life cycle assessment models, and the material quantities of the structural and non-structural materials over the 60-year building life shall be compared. The assessment shall demonstrate a reduction in life cycle impacts over the buildings lifetime including the impacts of repair and replacement.

This section is similar to section 303.1 of this code on Whole Building Life Cycle Assessment except in this case the design is increased over and above the minimum requirements of the IgCC and the IBC such that the project building will resist minimum design loads and other requirements with lower damage than it would otherwise experience during a natural or man-made event.

It is apparent that there needs to be significant shift in how we address natural disasters, moving away from the traditional focus on response and recovery toward emphasis on resiliency, that is, preventive actions to reduce the effects of a natural hazard. The goal of this requirement is to protect the building and its contents in addition to protecting the occupants, resulting in improved performance over the building life reducing environmental, societal and economic burdens of the building.

Bibliography:

[i] National Oceanic and Atmospheric Administration (NOAA) National Climate Data Center. 2011. <http://www.ncdc.noaa.gov/billions>. Accessed October 2013

[ii] Masters, J. 2011. "2011's Billion-Dollar Disasters: Is climate Change to Blame?" Weatherwise, March-April 2012, <http://www.weatherwise.org/Archives/Back%20Issues/2012/MarchApril%202012/dollar-disasters-full.html>.

[iii] Swiss Re website. News Release, 27 March 2013, Zurich. http://www.swissre.com/media/news_releases/nr_20130327_sigma_natcat_2012.html. Accessed October 2013

[iv] Weinkle, J., et. al. July 2012. "Historical Global Tropical Cyclone Landfalls" http://sciencepolicy.colorado.edu/admin/publication_files/2012.04.pdf

[v] National Oceanic and Atmospheric Administration (NOAA) National Climate Data Center. 2013. "U.S. Tornado Climatology", <http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html>. Updated May 17, 2013

[vi] Congressional Research Service Report (CRSR). 1997. Oceans & Coastal Resources: A Briefing Book, CRSR97-588 ENR. <http://www.cnie.org/NLE/CRSreports/BriefingBooks/Oceans>. Accessed November 13, 2012. [vii] Guin, J. and Saxena, V. 2002. "Extreme Losses from Natural Disasters - Earthquakes, Tropical Cyclones and Extratropical Cyclones", Applied Insurance Research Inc. http://www.air-worldwide.com/_public/NewsData/000208/Extreme_Losses.pdf

[viii] Masters, J. 2011. "2011's Billion-Dollar Disasters: Is climate Change to Blame?" Weatherwise, March-April 2012, <http://www.weatherwise.org/Archives/Back%20Issues/2012/MarchApril%202012/dollar-disasters-full.html>. Accessed October, 2013.

Cost Impact: Will increase the cost of construction. Will have an impact on initial cost in material selection and design. However, will have a positive cost impact resulting from improved performance over the building life.

GG339-14 : APPENDIX R (NEW)-PENG958

GG340-14

608.6 (New)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC ENERGY/WATER CODE DEVELOPMENT COMMITTEE.

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org); Jim Edelson, New Building Institute, representing NBI; Ryan Meres (ryan@imt.org)

Add new text as follows:

608.6 Construction site lighting. Temporary construction site lighting, including building site lighting, indoor lighting and lighting for temporary walkways, foot bridges, sidewalks and sheds, shall utilize lamps having an efficacy of not less than 60 lumens per watt. Such lighting shall be controlled by one or more master switches, labeled and located near to the primary access to the site, such that the lighting for the entire site can be turned off when not in use. General construction lighting shall be supplied by circuits that are separate from emergency egress lighting circuits.

Reason: This proposal would reduce the enormous waste of electricity used for lighting on construction sites. Construction sites often use hundreds of inefficient incandescent bulbs, and leave them on even when daylight is sufficient or the site is closed. This proposal would require construction sites to avoid the use of inefficient lamp types, and to make it easy to turn off the lighting when it is not needed for work.

The luminous efficacy requirement is that of the 2012 IECC for lamps over 40 watts.

Bibliography:

NYC Green Codes Task Force, Proposal EE16: Increase Lighting Efficiency on Construction Sites ([Proposal](#))

NYC Local Law 51 of 2010 ([Law](#))

NYC Building Code Sections 3307.2.1, 3307.2.1 and 3307.6.5 ([Code Reference](#))

Cost Impact: Will not increase the cost of construction.

GG340-14:409.4 (NEW)-SCHEIB1110

2014 PROPOSED CHANGES TO THE INTERNATIONAL GREEN CONSTRUCTION CODE (ENERGY/WATER)



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TENTATIVE ORDER OF DISCUSSION 2014 PROPOSED CHANGES TO THE INTERNATIONAL GREEN CONSTRUCTION CODE (ENERGY/WATER)

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

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation **does not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some GEW code change proposals may not be included on this list, as they are being heard by the General committee. Please consult the Cross Index of Proposed Changes. Note also that in this cycle, the hearing order places the code changes affecting hazardous materials first to give them proper attention.

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Proponent: Shaunna Mazingo, Colorado Code Consulting, LLC, representing Colorado Chapter of ICC, Inc (smazingo@coloradocode.net); Craig Conner, representing self

Revise as follows:

601.3 Application. ~~Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2. Buildings shall be designed and constructed in accordance with the *International Energy Conservation Code*.~~

601.3.1 Performance-based compliance. Buildings designed on a performance basis shall comply with ~~Sections 602, 608.6, 609, 610 and 614~~ Section 602 and the commercial mandatory and performance based requirements of the *International Energy Conservation Code*.

601.3.2 Prescriptive-based compliance. Buildings designed on a prescriptive basis shall comply with the requirements of ~~Sections 605, 606, 607, 608, 609, 610 and 614.~~ Section 602 and the commercial mandatory and prescriptive based requirements of the *International Energy Conservation Code*

601.4 Minimum requirements. ~~Buildings shall be provided with metering complying with Section 603, and commissioning complying with Section 611. Where required in accordance with Section 604.1, building shall be provided with automated demand response complying with Section 604.~~

601.5 Multiple buildings on a site and mixed use buildings. ~~Where there is more than one building on a site and where a building has more than one use in the building, each building or each portion of a building associated with a particular use shall comply with Sections 601.5.1 or 601.5.2 or a combination of both.~~

601.5.1 Multiple buildings on a site. ~~For building sites with multiple buildings, the energy use associated with the building site shall be assigned on a proportional basis to each building based on total gross floor area of each building in relation to the total gross floor area of all buildings on the building site.~~

~~Where energy is derived from either renewable or waste energy, or both sources located on the building site, within individual buildings, or on individual buildings and delivered to multiple buildings, the energy so derived shall be assigned on a proportional basis to the buildings served based on building gross floor area. Energy delivered from renewable and waste energy sources located on or within a building shall be assigned to that building.~~

Exception: ~~Where it can be shown that energy to be used at the building site is associated with a specific building, that energy use shall be assigned to that specific building.~~

601.5.2 Mixed use buildings. ~~Where buildings have more than one use, the energy use requirements shall be based on each individual occupancy.~~

~~602 MODELED PERFORMANCE PATHWAY REQUIREMENTS~~

~~603 ENERGY METERING, MONITORING AND REPORTING~~

~~604 AUTOMATED DEMAND RESPONSE (AUTO-DR) INFRASTRUCTURE~~

~~605 BUILDING ENVELOPE SYSTEMS~~

~~606 BUILDING MECHANICAL SYSTEMS~~

607 BUILDING SERVICE WATER HEATING SYSTEMS

608 BUILDING ELECTRICAL POWER AND LIGHTING SYSTEMS

609 SPECIFIC APPLIANCES AND EQUIPMENT

610-602 BUILDING RENEWABLE ENERGY SYSTEMS

611 ENERGY SYSTEMS COMMISSIONING AND COMPLETION

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. ~~Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.~~
3. 2. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice—The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: _____ zEPI: _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post Certificate of Occupancy zEPI, energy demand, and CO₂e emissions reporting	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(portions of table not shown remain unchanged)

302.1.1 zEPI of 46 or less. Where a zEPI of 46 or less is indicated by the jurisdiction in Table 302.1, buildings shall comply on a performance basis in accordance with Section 601.3.1.

Exception: Buildings less than 25,000 square feet (2323 m²) in *total building floor area* pursuing compliance on a prescriptive basis shall be deemed to have a zEPI of 51 and shall not be required to comply with the zEPI of Jurisdictional Choice indicated by the jurisdiction in Table 302.1.

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 6: Energy						
Energy consumption, monitoring, targeting and reporting						
a. Monitoring system	X	None	Inspection and verification	During construction and prior to occupancy	None	603, 610.5
b. Calibration	X	X	Testing and review and evaluation or test reports	During commissioning	Annually	603, 610.5
Mechanical systems completion — all buildings						
a. Air system balancing— provide the means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.1 and through reference to IECC
b. Hydronic system balancing— provide means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.2 and through reference to IECC
c. Mechanical system manuals— construction documents to require O&M manual	X	None	Verification of construction documents	Plan review	None	611.1.5.2
Mechanical systems — buildings over 5,000 square feet total building floor area						
a. Commissioning required and noted in plans and specifications	X	None	Verification of construction documents	Plan review	None	611.1
b. Documentation of required commissioning outcomes	X	None	Verification with the building owner	Subsequent to completion of all commissioning activities	None	611.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
c. Preparation and availability of a commissioning plan	X	None	Verification with the RDP or commissioning agent	Between plan review and commissioning initiation	None	611.1.1
d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.2
e. Functional performance testing of HVAC equipment	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3
f. Functional performance testing of HVAC controls and control systems	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3.2
g. Preparation of preliminary commissioning report	None	X	HVAC system installer/contractor or commissioning agent	None	Subsequent to commissioning	611.1.4
h. Acceptance of HVAC systems and equipment/system verification report	None	X	Building owner	None	Letter verifying receipt of the commissioning report	611.1.4.1
i. Preparation and distribution of final HVAC system completion — Documentation that construction documents require drawings, manuals, balancing reports and commissioning report be provided to the owner and that they have been provided	None	X	RDP, contractor or commissioning authority	None	90 days after final certificate of occupancy	611.1.5
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4
Plug load controls	X	None	Functional testing	Final inspection	None	608.6

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.4
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10
Lighting controls						
a. Installation	X	None	Field inspection	Post installation	None	608.11
b. Calibration	X	X	System installer/contractor or commissioning agent	Post installation	18-24 months	611.3.3

(portions of Table not shown remain unchanged)

904.3 Building operations and maintenance documents. The building operations and maintenance documents shall consist of manufacturer's specifications and recommendations, programming procedures and data points, narratives, and other means of illustrating to the owner how the building, site and systems are intended to be maintained and operated. The following information shall be included in the materials, as applicable to the specific project:

1. Directions to the owner or occupant on the manual cover sheet indicating that at least one copy of the materials shall be in the possession of the owner or occupant.
2. Operations and maintenance manuals for equipment, products and systems installed under or related to the provisions of Chapter 4 including, but not limited to, the following, as applicable:
 - 2.1. Vegetative shading, vegetative roofs and natural resource protections and setbacks.
 - 2.2. Water-conserving landscape and irrigation systems.
 - 2.3. Stormwater management systems.
 - 2.4. Permanent erosion control measures.
 - 2.5. Landscape or tree management plans.
3. Operations and maintenance documents for materials, products, assemblies and systems installed under or related to the provisions of this code for material resource conservation in accordance with Chapter 5 including, but not limited to, the following, as applicable:
 - 3.1. Care and maintenance instructions and recommended replacement schedule for flooring, including, but not limited to, carpeting, walk-off mats and tile.
 - 3.2. Care and maintenance instructions for natural materials including, but not limited to, wood, bio-based materials and stone.
 - 3.3. Available manufacturer's instructions on maintenance for:
 - 3.3.1. Exterior wall finishes.
 - 3.3.2. Roof coverings.
 - 3.3.3. Exterior doors, windows and skylights.

- 3.4. Information and recommended schedule for required routine maintenance measures, including, but not limited to, painting and refinishing.
4. ~~Operations and maintenance documents for equipment, products and systems installed under or related to the provisions of this code for energy conservation in accordance with Chapter 6 including, but not limited to, the following:~~
- ~~4.1. Heating, ventilating and air conditioning systems including: Domestic hot water systems including performance criteria and controls.

 - ~~4.1.1. Recommended equipment maintenance schedule.~~
 - ~~4.1.2. Air filters and fluid filters, including recommended replacement schedule and materials.~~
 - ~~4.1.3. Time clocks, including settings determined during commissioning.~~
 - ~~4.1.4. Programmable controls and thermostats, including settings determined during commissioning.~~~~
 - ~~4.2. *Building thermal envelope* systems including:

 - ~~4.2.1. Glazing systems inspection schedule.~~
 - ~~4.2.2. Performance criteria for replacements and repairs.~~
 - ~~4.2.3. Information and recommended schedule on required routine maintenance measures, including but not limited to, sealants, mortar joints and screens.~~~~
 - ~~4.3. Electrical and lighting systems including: Automatic demand reduction systems.

 - ~~4.3.1. Technical specifications and operating instructions for installed lighting equipment.~~
 - ~~4.3.2. Luminaire maintenance and cleaning plan.~~
 - ~~4.3.3. Lamp schedule, recommended relamping plan, and lamp disposal information.~~
 - ~~4.3.4. Programmable and automatic controls documentation, including settings determined during commissioning.~~
 - ~~4.3.5. Occupant sensor and daylight sensors documentation, including settings determined during commissioning.~~~~
- 5 4. Operations and maintenance documents for equipment, products and systems installed under or related to the provisions of this code for water conservation in accordance with Chapter 7, including, but not limited to the following:
- ~~5.1~~ 4.1. Domestic fixtures.
 - ~~5.2~~ 4.2. Water-regulating devices including faucets and valves.
 - ~~5.3~~ 4.3. Irrigation and rainwater and gray water catchment.
- 6 5. Operations and maintenance documents for equipment products and systems under or related to the provisions of this code for indoor environmental quality in accordance with Chapter 8, including, but not limited to, the following:
- ~~6.1~~ 5.1. Humidification/dehumidification.
 - ~~6.2~~ 5.2. Green cleaning products, procedures and techniques.
 - ~~6.3~~ 5.3. Recommended window cleaning schedule.
 - ~~6.4~~ 5.4. Ventilation controls.
 - ~~6.5~~ 5.5. Floor finishes.
 - ~~6.6~~ 5.6. Fireplaces and combustion appliances.

Delete without substitution:

~~1007.3 Post certificate of occupancy zEPI, energy demand, and CO₂e emissions reporting.~~ Where the jurisdiction indicates in Table 302.1 that ongoing post certificate of occupancy zEPI, energy demand and CO₂e emissions reporting is required, and where the jurisdiction has indicated in Table 302.1 that enhanced energy performance in accordance with Section 302.1 or CO₂e emissions in accordance with Section 602.2 are required, zEPI, energy demand, and CO₂e emissions reporting shall be provided in accordance with this section.

~~**1007.3.1 Purpose.** The purpose of this section is to provide for the uniform reporting and display of the total annual net energy use, peak demand for each energy form and emissions associated with building operations and building sites.~~

~~**1007.3.2 Intent.** The intent of these requirements is to provide for the ongoing reporting and display of the total annual net energy use, peak energy demand and emissions associated with operation of the building and its systems to document ongoing compliance with the provisions of Sections 601 and 602.~~

~~**1007.3.3 Reporting.** Reports in accordance with Sections 1007.3.3.1 through 1007.3.3.3 shall be generated.~~

~~**1007.3.3.1 Annual net energy use.** The zEPI associated with the operation of the building and the buildings on the site, as determined in accordance with Section 602.1, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].~~

~~Where there are multiple buildings on a building site, each building shall have its zEPI reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the zEPI for the building site shall be reported separately.~~

~~Energy use for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.~~

~~**1007.3.3.2 Peak monthly energy demand reporting.** The peak demand of all energy forms serving each building and the building site shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].~~

~~Where there are multiple buildings on a building site, each building shall have its energy demand reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the energy demand for the building site shall be reported separately.~~

~~Monthly energy demand data for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.~~

~~**1007.3.3.3 Annual CO₂e emissions reporting.** The annual emissions associated with the operation of the building and its systems, as determined in accordance with Section 602.2, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].~~

~~Where there are multiple buildings on a building site, each building shall have its annual emissions reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the annual CO₂e emissions for the building site shall be reported separately.~~

~~Emissions reported for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.~~

Delete without substitution:

~~A106 ENERGY CONSERVATION, EFFICIENCY AND EARTH ATMOSPHERIC QUALITY~~

Reason: The 2012 IgCC is not being adopted. The few jurisdictions that are adopting the IgCC are adopting it with a limited scope, as a "voluntary" code or outright deleting the Chapter 6 (Dallas Texas). We stand the chance of losing the IGCC and all of the hard work that has been put into it because it is not profitable to publish a book that nobody buys. Code officials have expressed

over and over again that the energy codes have gone far enough and feel as though the IgCC energy provisions are far too complicated to learn, understand and enforce therefore most either don't adopt it or don't use it if they do adopt it. If that is the case, then are we really seeing any pay off for all of those efforts?

By proposing that the energy provisions of the IgCC simply reflect the provisions of the code that it is supposed to overlay, the IECC, there will be more buy in and eventual use of the code because it will be something that is already understood and being used. Sure, the energy provisions won't be much above code, with the exception of the renewable requirements, but are we getting above code now when nobody is using it? Wouldn't it

be better to leave the remaining chapters of the IgCC to carry the above code requirements and let Chapter 6 reflect the requirements that people are slowly getting used to in the IECC? The IECC has been advancing so fast that it has been hard to keep up with it. We would propose that it has advanced enough that we could use the requirements in it as the base for this code for at least one code cycle to see if it makes a difference in the adoption and use of this code.

The final action hearings for the IECC ended only a couple of months prior to the deadline for submitting changes to the IgCC. The 2015 IECC wasn't even published by the deadline for these submittals. Most of the time we are guessing what those IECC requirements are truly going to be while attempting to write something that is supposed to go above those requirements in efficiency. It's pretty hard to do when you don't really know what the IECC says yet.

If the IECC commercial provisions become the basis for Chapter 6 of the IGCC then we have eliminated the problem of not knowing what one says before we have to write the next. We eliminate the need for a third round of hearings because we can now write the IECC and the IGCC at the same time, while all of the same code writers are already in the room together. We can save ICC tens of thousands of dollars on separate hearings. We may even be able to save this code from extinction.

How long will a publisher keep publishing a book that is not used? We could find ourselves having to rely on other standards for a green code because it isn't worth continuing the cost of hearings and publishing for this code. The problem with that is that we don't have as much opportunity for input into those other documents. The ICC Code Development process is one of a kind. We can't afford to lose that for this type of code. It needs our input but if all of that input makes a document that nobody uses, it's time to rethink our strategy. What will make this code get used? We've researched the reasons for limited use and the same comment comes up over and over again-- make the energy chapter something that is understandable and easier to use. People keep saying that the IECC is advancing so fast that we need to take a break and let people catch up with the requirements and learning the new technologies and applications before trudging forward. Let's give it to them this cycle in the IGCC and see if it works

This proposal references the IECC in the new Section 601.3 with the same code language that the IBC does. As such it would also allow the use of ASHRAE90.1.

There are plenty of other provisions in this code that make it "green" and above code. All of those other requirements aren't found in other codes so they are "above code". Let them carry the IgCC for a cycle. At its core, this proposal is simply an effort to get the IgCC adopted and used by making it simpler and more familiar to the user.

Cost Impact: Will not increase the cost of construction. This proposal will likely reduce the cost of construction in most instances.

GEW1-14: 601.3.1-MOZINGO994

GEW2-14

302.1, 302.1.1, 1003.2.2, Chapter 6, 1007.3, 1007.3.1, 1007.3.2, 1007.3.3, 1007.3.3.1, 1007.3.3.2, 1007.3.3.3, A106

Proponent: Mark Nowak, Steel Framing Alliance, representing Steel Framing Alliance (mark@mnowak.net)

Revise as follows:

CHAPTER 6 ENERGY CONSERVATION, ~~EFFICIENCY AND CO₂e~~ EMISSION REDUCTION

601.3 Application. Buildings and their associated building sites shall comply with Section ~~C407~~ 601.3.1 or Section 601.3.2 of the *International Energy Conservation Code* and shall exceed the requirements of Section C407 by not less than 10 percent.

601.3.1 Performance-based compliance. Buildings designed on a performance basis shall comply with Sections 602, 608.6, 609, 610 and 611.

601.3.2 Prescriptive-based compliance. Buildings designed on a prescriptive basis shall comply with the requirements of Sections 605, 606, 607, 608, 609, 610 and 611.

601.4 Minimum requirements. Buildings shall be provided with metering complying with Section 603, and commissioning complying with Section 611. ~~Where required in accordance with Section 604.1, building shall be provided with automated demand response complying with Section 604.~~

~~602 MODELED PERFORMANCE PATHWAY REQUIREMENTS~~

603.5.1 Annual emissions. ~~The data acquisition and management system shall be capable of providing the data necessary to calculate the annual CO₂e emissions associated with the operation of the building and its systems using the results of annual energy use measured in accordance with Section 603.5. The calculation shall be based on energy measured for each form of energy delivered to the site on an annual basis. Where reporting of emissions is required, the determination of emissions shall be in accordance with Section 602.2.3.~~

~~604 AUTOMATED DEMAND RESPONSE (AUTO-DR) INFRASTRUCTURE~~

~~605 BUILDING ENVELOPE SYSTEMS~~

~~606 BUILDING MECHANICAL SYSTEMS~~

~~607 BUILDING SERVICE WATER HEATING SYSTEMS~~

~~608 BUILDING ELECTRICAL POWER AND LIGHTING SYSTEMS~~

~~609 SPECIFIC APPLIANCES AND EQUIPMENT~~

610.1.1 Building performance-based compliance. Buildings and surrounding property or building sites where there are multiple buildings on the building site, ~~that are designed and constructed in accordance with Section 601.3.1, performance-based compliance,~~ shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total calculated annual energy use of the building, or collective buildings on the site.

610.1.2 Building prescriptive compliance. Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.2, prescriptive compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the building site, with onsite renewable energy by calculation demonstrating that onsite renewable energy production has a rating of not less than 1.75 Btu/h (0.5 W) or not less than 0.50 watts per square foot of conditioned floor area, and using any single or combination of renewable energy generation systems meeting the requirements of Sections 610.2, 610.3, or 610.4.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: _____ zEPI: _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post Certificate of Occupancy zEPI, energy demand, and CO₂e emissions reporting	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(portions of table not shown remain unchanged)

302.1.1 zEPI of 46 or less. Where a zEPI of 46 or less is indicated by the jurisdiction in Table 302.1, buildings shall comply on a performance basis in accordance with Section 601.3.1.

Exception: Buildings less than 25,000 square feet (2323 m²) in total building floor area pursuing compliance on a prescriptive basis shall be deemed to have a zEPI of 51 and shall not be required to comply with the zEPI of Jurisdictional Choice indicated by the jurisdiction in Table 302.1.

Revise as follows:

1003.2.2 Heating, ventilating and air-conditioning. Heating, ventilating and air-conditioning systems and equipment shall be in accordance with the following:

1. Time clock and automatic time switch controls that can turn systems off and on according to building occupancy requirements shall be provided and connected to the following HVAC equipment: chillers and other space-cooling equipment, chilled water pumps, boilers and other space-heating devices, hot water pumps, heat exchanger circulation pumps, supply fans, return fans, and exhaust fans. Where occupant override is provided, it shall be designed with a timer to automatically revert to time clock and automatic time switch controls in not longer than 12 hours.

Exception: A time clock or automatic time switch controls shall not be required for spaces where any of the following conditions exist:

1. A time clock is not required by Section C403.2.4.3 of the *International Energy Conservation Code*.
2. There is 24-hour occupancy materials with special atmospheric requirements dependent on 24-hour space conditioning.
3. A majority of the areas of the building served by the system are under setback thermostat control.
4. Manufacturer's specifications stipulate that the system must not be shut off.

2. Functional outside air economizers shall be provided on all cooling systems or more than 4 ½ tons cooling capacity, 54,000 Btu/h, or more than 1800 cfm (9.144 m³/s x m²) air flow, provided manufactures' guidelines are available for adding the economizer to the existing system.

Exception: An outside air economizer shall not be required for buildings or special uses where 100 percent outside air for ventilation is required or where any of the following conditions exist:

1. Section C403.3.1 of the *International Energy Conservation Code* would not require an economizer.
2. The existing system has a water-based economizer.
3. The existing system does not have an outside air intake.
4. Special economizer operations such as, but not limited to, carefully controlled humidity would require more energy use than is conserved.
5. There is insufficient space to install necessary equipment.
6. Installation of an economizer would require major modifications to the building's life safety system.
7. The existing system is a multi-zone system where the same intake air is used at the same time for either heating or cooling in different parts of the building.

3. HVAC piping and ducts, including those located above suspended ceilings, shall comply with Sections 606.3 and 606.4.

Exception: Additional insulation shall not be required for piping where any of the following conditions exist:

1. Additional insulation shall not be required for piping where any of the following conditions exist:
 - 1.1. It is located within HVAC equipment;

- 1.2. It is located within conditioned space that conveys fluids between 60°F (15.6°C) and 105°F (40.6°C);
- 1.3. Piping that is already insulated and the insulation is in good condition; or
2. Where HVAC ducts and piping are installed in a building cavity or interstitial framing space of insufficient width to accommodate the duct or pipe and the insulation required by Section 606.3 and Table 606.4, the insulation thickness shall be permitted to have the maximum thickness that the wall can accommodate, but shall not be less than 1/2-inch (12.7 mm) thick.
4. Where central heat is intended to be replaced with individual electric space heaters, the application for the electrical permit shall include documentation demonstrating that the new electric heaters will not consume more energy than the existing nonelectric heaters.
5. Boiler systems shall have been cleaned and tuned within one year prior to the alteration. Boilers shall be equipped with an outdoor air lock-out thermostat or a temperature reset control.
6. Chillers shall be equipped with an outdoor air lockout thermostat and chilled water reset control.
7. A maximum 5-year phase out plan shall be provided for buildings with existing systems that use CFC-based refrigerants.
8. Where mechanical and electrical systems and equipment are joined with microprocessors that communicate with each other or to a computer, a properly integrated building automation system shall be installed to optimize energy, operations, and indoor comfort. The building automation system shall:
 - 8.1. Allow the owner to set up schedules of operation for the equipment and provide equipment optimal start with adaptive learning;
 - 8.2. Provide trim and respond capabilities based on zone demand;
 - 8.3. Offer the ability to monitor energy usage, including the ability to meter electric, gas, water, steam, hot water, chilled water, and fuel oil services;
 - 8.4. Offer economizing based on enthalpy calculation and/or CO₂ set point control;
 - 8.5. Offer load shedding when power companies are at peak demand and need; and
 - 8.6. Offer the ability to send alarms to alert building owner, manager, or operator when problems occur due to system failures.

~~**1007.3.1 Purpose.** The purpose of this section is to provide for the uniform reporting and display of the total annual net energy use, peak demand for each energy form and emissions associated with building operations and building sites.~~

~~**1007.3.2 Intent.** The intent of these requirements is to provide for the ongoing reporting and display of the total annual net energy use, peak energy demand and emissions associated with operation of the building and its systems to document ongoing compliance with the provisions of Sections 601 and 602.~~

~~**1007.3.3 Reporting.** Reports in accordance with Sections 1007.3.3.1 through 1007.3.3.3 shall be generated.~~

~~**1007.3.3.1 Annual net energy use.** The zEPI associated with the operation of the building and the buildings on the site, as determined in accordance with Section 602.1, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].~~

~~Where there are multiple buildings on a building site, each building shall have its zEPI reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the zEPI for the building site shall be reported separately.~~

~~Energy use for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.~~

~~**1007.3.3.2 Peak monthly energy demand reporting.** The peak demand of all energy forms serving each building and the building site shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].~~

~~Where there are multiple buildings on a building site, each building shall have its energy demand reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the energy demand for the building site shall be reported separately.~~

~~Monthly energy demand data for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.~~

~~**1007.3.3.3 Annual CO₂e emissions reporting.** The annual emissions associated with the operation of the building and its systems, as determined in accordance with Section 602.2, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].~~

~~Where there are multiple buildings on a building site, each building shall have its annual emissions reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the annual CO₂e emissions for the building site shall be reported separately.~~

~~Emissions reported for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.~~

Delete without substitution:

~~**A106 ENERGY CONSERVATION, EFFICIENCY AND EARTH ATMOSPHERIC QUALITY**~~

Reason: This proposal simplifies the code by relying on the base IECC code to achieve a higher performing building. It will eliminate the need for code officials, designers, owners, and others to learn and implement an approach and terminology that is vastly different from the base IECC code, and it eliminates the need to use two different methods to comply with the two codes. It will, however, retain the benefits of a green code that exceeds the base code in a balanced and flexible manner. Users of the code will be able to continue to use the performance path in the IECC but the level of performance will be required to be 10% higher. This is a simplification of the code that will allow owners to determine how to best achieve the energy efficiency objectives of the code.

Further, this proposal eliminates the arbitrary prescriptive requirements from the IgCC for a 10% decrease in the IECC U-factors. To apply an arbitrary reduction as a percentage to the IECC U-factors is inappropriate for the following reasons:

A 10% U-factor decrease is not the same as a 10% increase in performance.

-This introduces an inconsistent standard whereby assemblies with different U-factors in the IECC will be required to meet a higher incremental level of performance in the IgCC simply because their U-factors in the IECC are higher than other assemblies.

The 10% U-factor decrease is discriminatory against some building materials due to the differences in their costs of construction versus other materials. As stated above, this creates a different "standard" for performance for some materials versus others compared to the base IECC document.

If the IECC is based on an optimized design that balances life cycle costs with performance, there is no rationale to support more stringent U-factors in the IgCC. Even a "green" code or standard should be based on some level of cost-effectiveness. There is no such substantiation provided to support an arbitrary 10% decrease in U-factors. In warmer climate zones, there will be little to no energy savings from the U-factor increases.

Cost Impact: Will not increase the cost of construction.

GEW2-14: CHAPTER 6-NOWAK993

GEW3-14

Chapter 6, 202, 302.1, 302.1.1, 903.1, 1003.2.2, 1003.2.3, 1007.3, 1007.3.1, 1007.3.2, 1007.3.3, 1007.3.3.1, 1007.3.3.2, 1007.3.3.3, Chapter 12, Table A106, A106.1, A106.5.1, A106.5.2, A106.6

Proponent: Steven Rosenstock, Electric Edison Institute, representing Edison Electric Institute (srosenstock@eei.org)

Delete without substitution:

SECTION 202 DEFINITIONS

~~**ZERO ENERGY PERFORMANCE INDEX (zEPI).** A scalar representing the ratio of energy performance of the proposed design compared to the average energy performance of buildings relative to a benchmark year.~~

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 604.3.1 or Section 604.3.2. the requirements of Section 7 and Normative Appendices A through D of the ASHRAE 189.1.

~~**601.3.1 Performance-based compliance.** Buildings designed on a performance basis shall comply with Sections 602, 608.6, 609, 610 and 611.~~

~~**601.3.2 Prescriptive-based compliance.** Buildings designed on a prescriptive basis shall comply with the requirements of Sections 605, 606, 607, 608, 609, 610 and 611.~~

~~**601.4 Minimum requirements.** Buildings shall be provided with metering complying with Section 603, and commissioning complying with Section 611. Where required in accordance with Section 604.1, building shall be provided with automated demand response complying with Section 604.~~

~~**601.5 Multiple buildings on a site and mixed use buildings.** Where there is more than one building on a site and where a building has more than one use in the building, each building or each portion of a building associated with a particular use shall comply with Sections 601.5.1 or 601.5.2 or a combination of both.~~

~~**601.5.1 Multiple buildings on a site.** For building sites with multiple buildings, the energy use associated with the building site shall be assigned on a proportional basis to each building based on total gross floor area of each building in relation to the total gross floor area of all buildings on the building site.~~

~~Where energy is derived from either renewable or waste energy, or both sources located on the building site, within individual buildings, or on individual buildings and delivered to multiple buildings, the energy so derived shall be assigned on a proportional basis to the buildings served based on building gross floor area. Energy delivered from renewable and waste energy sources located on or within a building shall be assigned to that building.~~

~~**Exception:** Where it can be shown that energy to be used at the building site is associated with a specific building, that energy use shall be assigned to that specific building.~~

~~**601.5.2 Mixed use buildings.** Where buildings have more than one use, the energy use requirements shall be based on each individual occupancy.~~

~~602 MODELED PERFORMANCE PATHWAY REQUIREMENTS~~

~~603 ENERGY METERING, MONITORING AND REPORTING~~

~~604 AUTOMATED DEMAND RESPONSE (AUTO-DR) INFRASTRUCTURE~~

~~605 BUILDING ENVELOPE SYSTEMS~~

~~606 BUILDING MECHANICAL SYSTEMS~~

~~607 BUILDING SERVICE WATER HEATING SYSTEMS~~

~~608 BUILDING ELECTRICAL POWER AND LIGHTING SYSTEMS~~

~~609 SPECIFIC APPLIANCES AND EQUIPMENT~~

~~610 BUILDING RENEWABLE ENERGY SYSTEMS~~

~~611 ENERGY SYSTEMS COMMISSIONING AND COMPLETION~~

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less the required improvement compared to ASHRAE 189.1 in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
302.1, 302.1.1, 602.1	zEPI <u>Improvement compared to ASHRAE 189.1</u> of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less <u>the required energy cost improvement compared to ASHRAE 189.1</u> in each occupancy for which it intends to require enhanced energy performance.	Occupancy: _____ zEPI <u>Improvement compared to ASHRAE 189.1:</u> _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post-Certificate of Occupancy zEPI, energy demand, and CO ₂ e emissions reporting	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(portions of table not shown remain unchanged)

302.1.1 zEPI of 46 or less. Improvement compared to ASHRAE 189.1 Where a zEPI of 46 or less an improvement compared to ASHRAE 189.1 is indicated by the jurisdiction in Table 302.1, buildings shall comply on a performance-basis in accordance with Section 601.3.1.

Exception: Buildings less than 25,000 square feet (2323 m²) in total building floor area pursuing compliance on a prescriptive basis shall be deemed to ~~have a zEPI of 54~~ comply with ASHRAE 18.1 and shall not be required to comply with the zEPI improvement compared to ASHRAE 189.1 of Jurisdictional Choice indicated by the jurisdiction in Table 302.1.

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and approved by the code official.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the code official, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the code official. The approved agency shall provide written documentation to the code official demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 6: Energy						
Energy consumption, monitoring, targeting and reporting						
a. Monitoring system	X	None	Inspection and verification	During construction and prior to occupancy	None	603, 610.5 Section 10.3 of ASHRAE 189.1
b. Calibration	X	X	Testing and review and evaluation or test reports	During commissioning	Annually	603, 610.5 Section 10.3 of ASHRAE 189.1
Mechanical systems completion – all buildings						
a. Air system balancing – provide the means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.1 and through reference to IECC Section 10.3 of ASHRAE 189.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
b. Hydronic system balancing – provide means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.2 and through reference to IECC Section 10.3 of ASHRAE 189.1
c. Mechanical system manuals – construction documents to require O&M manual	X	None	Verification of construction documents	Plan review	None	611.1.5.2 Section 10.3 of ASHRAE 189.1
Mechanical systems – buildings over 5,000 square feet total building floor area						
a. Commissioning required and noted in plans and specifications	X	None	Verification of construction documents	Plan review	None	611.1 Section 10.3 of ASHRAE 189.1
b. Documentation of required commissioning outcomes	X	None	Verification with the building owner	Subsequent to completion of all commissioning activities	None	611.1 Section 10.3 of ASHRAE 189.1
c. Preparation and availability of a commissioning plan	X	None	Verification with the RDP or commissioning	Between plan review and commissioning initiation	None	611.1.1 Section 10.3 of ASHRAE 189.1
d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer/contractor or commissioning	After installation of HVAC systems and prior to occupancy	TBD	611.1.2 Section 10.3 of ASHRAE 189.1
e. Functional performance testing of HVAC equipment	X	X	HVAC system installer/contractor or commissioning	After installation of HVAC systems and prior to occupancy	TBD	611.1.3 Section 10.3 of ASHRAE 189.1
f. Functional performance testing of HVAC controls and control systems	X	X	HVAC system installer/contractor or commissioning	After installation of HVAC systems and prior to occupancy	TBD	611.1.3.2 Section 10.3 of ASHRAE 189.1
g. Preparation of preliminary commissioning report	None	X	HVAC system installer/contractor or commissioning	None	Subsequent to commissioning	611.1.4 Section 10.3 of ASHRAE 189.1
h. Acceptance of HVAC systems and equipment/system verification report	None	X	Building owner	None	Letter verifying receipt of the commissioning report	611.1.4.1 Section 10.3 of ASHRAE 189.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
i. Preparation and distribution of final HVAC system completion— Documentation that construction documents require drawings, manuals, balancing reports and commissioning report be provided to the owner and that they have been provided	None	X	RDP, contractor or commissioning authority	None	90 days after final certificate of occupancy	611.1.5 Section 10.3 of ASHRAE 189.1
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4 Section 10.3 of ASHRAE 189.1
Plug load controls	X	None	Functional testing	Final inspection	None	608.6 Section 10.3 of ASHRAE 189.1
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6 Section 10.3 of ASHRAE 189.1
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1 Section 10.3 of ASHRAE 189.1
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10 Section 10.3 of ASHRAE 189.1
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10 Section 10.3 of ASHRAE 189.1
Lighting controls						
a. Installation	X	None	Field inspection	Post-installation	None	608.11 Section 10.3 of ASHRAE 189.1
b. Calibration	X	X	System installer/contractor or commissioning agent	Post-installation	18-24 months	611.3.3 Section 10.3 of ASHRAE 189.1

For SI: 1 square foot = 0.0929 m².

Revise as follows:

1003.2.2 Heating, ventilating and air-conditioning. Heating, ventilating and air-conditioning systems and equipment shall be in accordance with the following:

1. Time clock and automatic time switch controls that can turn systems off and on according to building occupancy requirements shall be provided and connected to the following HVAC equipment: chillers and other space-cooling equipment, chilled water

pumps, boilers and other space-heating devices, hot water pumps, heat exchanger circulation pumps, supply fans, return fans, and exhaust fans. Where occupant override is provided, it shall be designed with a timer to automatically revert to time clock and automatic time switch controls in not longer than 12 hours.

Exception: A time clock or automatic time switch controls shall not be required for spaces where any of the following conditions exist:

1. A time clock is not required by Section C403.2.4.3 of the *International Energy Conservation Code*.
 2. There is 24-hour occupancy materials with special atmospheric requirements dependent on 24-hour space conditioning.
 3. A majority of the areas of the building served by the system are under setback thermostat control.
 4. Manufacturer's specifications stipulate that the system must not be shut off.
2. Functional outside air economizers shall be provided on all cooling systems or more than 4 ½ tons cooling capacity, 54,000 Btu/h, or more than 1800 cfm (9.144 m³/s x m²) air flow, provided manufactures' guidelines are available for adding the economizer to the existing system.

Exception: An outside air economizer shall not be required for buildings or special uses where 100 percent outside air for ventilation is required or where any of the following conditions exist:

1. Section C403.3.1 of the *International Energy Conservation Code* would not require an economizer.
 2. The existing system has a water-based economizer.
 3. The existing system does not have an outside air intake.
 4. Special economizer operations such as, but not limited to, carefully controlled humidity would require more energy use than is conserved.
 5. There is insufficient space to install necessary equipment.
 6. Installation of an economizer would require major modifications to the building's life safety system.
 7. The existing system is a multi-zone system where the same intake air is used at the same time for either heating or cooling in different parts of the building.
3. HVAC piping and ducts, including those located above suspended ceilings, shall comply with ~~Sections 606.3 and 606.4~~ Section 7 of ASHRAE 189.1.

Exception: Additional insulation shall not be required for piping where any of the following conditions exist:

1. Additional insulation shall not be required for piping where any of the following conditions exist:
 - 1.1. It is located within HVAC equipment;
 - 1.2. It is located within conditioned space that conveys fluids between 60°F (15.6°C) and 105°F (40.6°C);
 - 1.3. Piping that is already insulated and the insulation is in good condition; or
2. Where HVAC ducts and piping are installed in a building cavity or interstitial framing space of insufficient width to accommodate the

duct or pipe and the insulation required by ~~Section 606.3 and Table 606.4~~ Section 7 of ASHRAE 189.1, the insulation thickness shall be permitted to have the maximum thickness that the wall can accommodate, but shall not be less than 1/2 -inch (12.7 mm) thick.

2

4. Where central heat is intended to be replaced with individual electric space heaters, the application for the electrical permit shall include documentation demonstrating that the new electric heaters will not consume more energy than the existing nonelectric heaters.
5. Boiler systems shall have been cleaned and tuned within one year prior to the alteration. Boilers shall be equipped with an outdoor air lock-out thermostat or a temperature reset control.
6. Chillers shall be equipped with an outdoor air lockout thermostat and chilled water reset control.
7. A maximum 5-year phase out plan shall be provided for buildings with existing systems that use CFC-based refrigerants.
8. Where mechanical and electrical systems and equipment are joined with microprocessors that communicate with each other or to a computer, a properly integrated building automation system shall be installed to optimize energy, operations, and indoor comfort. The building automation system shall:
 - 8.1. Allow the owner to set up schedules of operation for the equipment and provide equipment optimal start with adaptive learning;
 - 8.2. Provide trim and respond capabilities based on zone demand;
 - 8.3. Offer the ability to monitor energy usage, including the ability to meter electric, gas, water, steam, hot water, chilled water, and fuel oil services;
 - 8.4. Offer economizing based on enthalpy calculation and/or CO₂ set point control;
 - 8.5. Offer load shedding when power companies are at peak demand and need; and
 - 8.6. Offer the ability to send alarms to alert building owner, manager, or operator when problems occur due to system failures.

1003.2.3 Service water systems. Service water systems and equipment shall be in accordance with the following:

1. Water heater and hot water storage tanks shall have a combined minimum total of external and internal insulation value of R-16.
2. Accessible hot and cold water supply and distribution pipes shall comply with ~~Section 607.6~~ Section 7 of ASHRAE 189.1. The insulation shall not be required to extend beyond the *building thermal envelope*.
3. Circulating pump systems for hot water supply purposes other than comfort heating shall be controlled as specified in ~~Section 607.7~~ Section 7 of ASHRAE 189.1.
4. Showerhead, toilet, urinal and faucet flow rates shall be in accordance with this code.

1007.3 Post certificate of occupancy ~~zEP1~~ annual energy cost, energy demand, and CO₂e emissions reporting. Where the jurisdiction indicates in Table 302.1 that ongoing post certificate of occupancy ~~zEP1~~ annual energy cost, energy demand and CO₂e emissions reporting is required, and where the jurisdiction has indicated in Table 302.1 that enhanced energy performance in accordance with Section 302.1 or CO₂e emissions in accordance with ~~Section 602.2~~ Section 7 of ASHRAE 189.1 are required, ~~zEP1~~ annual energy cost, energy demand, and CO₂e emissions reporting shall be provided in accordance with this section.

1007.3.2 Intent. The intent of these requirements is to provide for the ongoing reporting and display of the total annual ~~net energy use~~ energy cost, peak energy demand and emissions associated with operation of the building and its systems to document ongoing compliance with the provisions of ~~Sections 604 and 602~~ Section 7 of ASHRAE 189.1.

1007.3.1 Purpose. The purpose of this section is to provide for the uniform reporting and display of the total annual ~~net energy use~~ energy cost, peak demand for each energy form and emissions associated with building operations and building sites.

1007.3.3 Reporting. Reports in accordance with Sections 1007.3.3.1 through 1007.3.3.3 shall be generated.

1007.3.3.1 Annual ~~net energy use~~ energy cost. The ~~zEPI~~ annual energy cost associated with the operation of the building and the buildings on the site, as determined in accordance with ~~Section 602.1~~ Section 7 of ASHRAE 189.1, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its ~~zEPI~~ annual energy cost reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the ~~zEPI~~ energy cost for the building site shall be reported separately.

Energy ~~use cost~~ for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.

1007.3.3.2 Peak monthly energy demand reporting. The peak demand of all energy forms serving each building and the building site shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its energy demand reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the energy demand for the building site shall be reported separately.

Monthly energy demand data for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.

1007.3.3.3 Annual CO₂e emissions reporting. The annual emissions associated with the operation of the building and its systems, as determined in accordance with ~~Section 602.2~~ Section 7 of ASHRAE 189.1, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its annual emissions reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the annual CO₂e emissions for the building site shall be reported separately.

Emissions reported for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.

Revise as follows:

**TABLE A106
ENERGY CONSERVATION AND EFFICIENCY**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 10 to establish the minimum total number of project electives that must be satisfied.	—
A106.1	zEPI <u>Energy cost</u> reduction project electives	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	Project zEPI <u>Energy cost</u> is at least 5 points <u>3 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 1 elective
A106.1	Project zEPI <u>Energy cost</u> is at least 10 points <u>6 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 2 electives
A106.1	Project zEPI <u>Energy cost</u> is at least 15 points <u>9 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 3 electives
A106.1	Project zEPI <u>Energy cost</u> is at least 20 points <u>12 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 4 electives
A106.1	Project zEPI <u>Energy cost</u> is at least 25 points <u>15 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 5 electives
A106.1	Project zEPI <u>Energy cost</u> is at least 30 points <u>18 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 6 electives
A106.1	Project zEPI <u>Energy cost</u> is at least 35 points <u>21 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 7 electives
A106.1	Project zEPI <u>Energy cost</u> is at least 40 points <u>24 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 8 electives
A106.1	Project zEPI <u>Energy cost</u> is at least 45 points <u>27 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 9 electives
A106.1	Project zEPI <u>Energy cost</u> is at least 51 points <u>30 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 10 electives
A106.2	Mechanical systems project elective	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.3	Service water heating	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.4	Lighting systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.5	Passive design	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—5 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—10 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—20 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No

A106.1 ~~zEPI~~ Energy cost reduction project electives. Project electives for buildings pursuing performance-based compliance in accordance with ~~Section 604.3.4~~ Section 7 of ASHRAE 189.1 shall be in accordance with the portions of Table A106 that reference Section A106.1, ~~Equation 6.4~~ and the calculation procedures specified in ~~Section 602.1.2.4~~ Section 7 of ASHRAE 189.1.

A106.5.1 Performance path. The building shall be designed using the performance path in accordance with ~~Section 604.3.4~~ Section 7 of ASHRAE 189.1.

A106.5.2 Passive design provisions. The simulation of energy use performed pursuant to ~~Section 602~~ Section 7 of ASHRAE 189.1 shall document that not less than 40 percent of the annual energy use cost reduction realized by the proposed design has been achieved through passive heating, cooling, and ventilation design, as compared to the standard reference design. Passive heating and cooling shall use strategies including, but not limited to, building orientation, fenestration provisions,

material selection, insulation choices, overhangs, shading means, microclimate vegetation and water use, passive cooling towers, natural heat storage, natural ventilation, and thermal mass.

A106.6 Renewable energy system project electives. Buildings seeking a renewable energy system project elective or electives shall be equipped with one or more renewable energy systems in accordance with ~~Section 610.4~~ Section 7 of ASHRAE 189.1 that have the capacity to provide the percent of annual energy used within the building as selected in Table A106. Capacity shall be demonstrated in accordance with ~~Section 610.1.1 or 610.1.2.~~ Section 7 of ASHRAE 189.1

Add new standard(s) as follows:

ASHRAE/IESNA Standard 189.1-2014 Standard for the Design of High-Performance Green Buildings Except for Low-Rise Residential Buildings

Reason: As currently written, Chapter 6 will be very hard to enforce by code officials. In addition, there are unintended consequences of the current provisions that could result in buildings that use more energy and produce more emissions.

By replacing the current language with Section 7 of ASHRAE 189.1, several goals will be accomplished:

- -The energy efficiency chapter will be based on a consensus-based ANSI process that went through several public reviews and is under continuous maintenance.
- -The energy efficiency provisions of the IGCC and ASHRAE 189.1 will be consistent and enforceable.
- -Builders and designers will not face significantly different compliance approaches when comparing ASHRAE Standard 189 with the IGCC. In addition, the authority having jurisdiction will be able to determine compliance with energy efficiency provisions more easily.

Cost Impact: Will not increase the cost of construction.

Analysis: This code change proposal addresses the scope and application of the *International Green Construction Code*. Therefore, the final action taken on this code change proposal will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition of this code change proposal in accordance with Section 1.3 of CP28, which stipulates that the ICC Board of Directors determines the scope of the I-Codes.

GEW3-14: 601.3-ROSENSTOCK458

GEW4-14

Chapter 6, 302.1, Table 302.1, 903.1, Table 903.1, A106

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner (craig.conner@mac.com) representing self.

Revise as follows:

~~**601.3 Application.** Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2. Buildings shall be designed and constructed in accordance with the *International Energy Conservation Code*.~~

~~**601.3.1 Performance-based compliance.** Buildings designed on a performance basis shall comply with Sections 602, 608.6, 609, 610 and 611.~~

~~**601.3.2 Prescriptive-based compliance.** Buildings designed on a prescriptive basis shall comply with the requirements of Sections 605, 606, 607, 608, 609, 610 and 611.~~

~~**601.4 Minimum requirements.** Buildings shall be provided with metering complying with Section 603, and commissioning complying with Section 611. Where required in accordance with Section 604.1, building shall be provided with automated demand response complying with Section 604.~~

~~**601.5.1 Multiple buildings on a site.** For building sites with multiple buildings, the energy use associated with the building site shall be assigned on a proportional basis to each building based on total gross floor area of each building in relation to the total gross floor area of all buildings on the building site.~~

~~Where energy is derived from either renewable or waste energy, or both sources located on the building site, within individual buildings, or on individual buildings and delivered to multiple buildings, the energy so derived shall be assigned on a proportional basis to the buildings served based on building gross floor area. Energy delivered from renewable and waste energy sources located on or within a building shall be assigned to that building.~~

~~**Exception:** Where it can be shown that energy to be used at the building site is associated with a specific building, that energy use shall be assigned to that specific building.~~

~~**601.5.2 Mixed use buildings.** Where buildings have more than one use, the energy use requirements shall be based on each individual occupancy.~~

~~602 MODELED PERFORMANCE PATHWAY REQUIREMENTS~~

~~603 ENERGY METERING, MONITORING AND REPORTING~~

~~604 AUTOMATED DEMAND RESPONSE (AUTO-DR) INFRASTRUCTURE~~

~~605 BUILDING ENVELOPE SYSTEMS~~

~~606 BUILDING MECHANICAL SYSTEMS~~

~~607 BUILDING SERVICE WATER HEATING SYSTEMS~~

~~608 BUILDING ELECTRICAL POWER AND LIGHTING SYSTEMS~~

609 SPECIFIC APPLIANCES AND EQUIPMENT

610 BUILDING RENEWABLE ENERGY SYSTEMS

611 ENERGY SYSTEMS COMMISSIONING AND COMPLETION

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
302.1, 302.1.1, 602-1	zEPI of Jurisdictional Choice — The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: _____ zEPI: _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(portions of table not shown remain unchanged)

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*. The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 6: Energy						
Energy consumption, monitoring, targeting and reporting						
a.—Monitoring system	X	None	Inspection and verification	During construction and prior to occupancy	None	603, 610.5

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
b. Calibration	X	X	Testing and review and evaluation or test reports	During commissioning	Annually	603, 610.5
Mechanical systems completion—all buildings						
a. Air system balancing—provide the means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.1 and through reference to IECC
b. Hydronic system balancing—provide means for system balancing	X	None	Inspection and verification	During construction and prior to occupancy	None	611.1.2.2 and through reference to IECC
e. Mechanical system manuals—construction documents to require O&M manual	X	None	Verification of construction documents	Plan review	None	611.1.5.2
Mechanical systems—buildings over 5,000 square feet total building floor area						
a. Commissioning required and noted in plans and specifications	X	None	Verification of construction documents	Plan review	None	611.1
b. Documentation of required commissioning outcomes	X	None	Verification with the building owner	Subsequent to completion of all commissioning activities	None	611.1
e. Preparation and availability of a commissioning plan	X	None	Verification with the RDP or commissioning agent	Between plan review and commissioning initiation	None	611.1.1
d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.2
e. Functional performance testing of HVAC equipment	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3
f. Functional performance testing of HVAC controls and control systems	X	X	HVAC system installer/contractor or commissioning agent	After installation of HVAC systems and prior to occupancy	TBD	611.1.3.2

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
g. Preparation of preliminary commissioning report	None	X	HVAC system installer/contractor or commissioning agent	None	Subsequent to commissioning	611.1.4
h. Acceptance of HVAC systems and equipment/system verification report	None	X	Building owner	None	Letter verifying receipt of the commissioning report	611.1.4.1
i. Preparation and distribution of final HVAC system completion — Documentation that construction documents require drawings, manuals, balancing reports and commissioning report be provided to the owner and that they have been provided	None	X	RDP, contractor or commissioning authority	None	90 days after final certificate of occupancy	611.1.5
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4
Plug load controls	X	None	Functional testing	Final inspection	None	608.6
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10
Lighting controls						
a. Installation	X	None	Field inspection	Post-installation	None	608.11
b. Calibration	X	X	System installer/contractor or commissioning agent	Post installation	18-24 months	611.3.3

(portions of Table not shown remain unchanged)

Delete without substitution

A106 ENERGY CONSERVATION, EFFICIENCY AND EARTH ATMOSPHERIC QUALITY

Reason: The IGCC energy chapter is the largest impediment for those considering adopting the IGCC. Many code officials just want to use the IECC. Few can read through Chapter 6 and understand it. Even catching up with all the accumulated changes in the 2015 IECC will be a challenge to many. The main calculations in the energy chapter, the zEPI and CO2 emission calculations, are not the same as the IECC or ASHRAE 90.1. This is not an overlay to the IECC. With this change the IgCC would refer to the IECC for energy related provisions.

Cost Impact: Will not increase the cost of construction. The IgCC will now refer to the IECC for practically all of the energy related provisions.

GEW4-14: 601.3-KLEIN1191

GEW5-14

601.3, 605.1, 606.1, 607.1, 608.1

Proponent: Jim Edelson, New Buildings Institute, representing New Buildings Institute; Maureen Guttman (mguttman@ase.org); David Collins (dcollins@preview-group.com)

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2. Where a requirement is provided in this chapter, it supersedes the corresponding requirement in the *International Energy Conservation Code*. For all other requirements, the building and the associated building site shall comply with the *International Energy Conservation Code*.

605.1 Prescriptive compliance. ~~Where buildings are~~ Buildings designed using the prescriptive-based compliance path in accordance with Section 601.3.2, ~~building thermal envelope systems shall comply with the provisions of Section C402 of the *International Energy Conservation Code* and the provisions of this section.~~

606.1 Prescriptive compliance. ~~Where buildings are~~ Buildings designed using the prescriptive-based compliance path in accordance with Section 601.3.2, ~~building mechanical systems shall comply with the provisions of the *International Energy Conservation Code* and the provisions of this section.~~

607.1 Prescriptive compliance. ~~Where buildings are~~ Buildings designed using the prescriptive-based compliance path in accordance with Section 601.3.2, ~~service water heating systems shall comply with the provisions of the *International Energy Conservation Code* and the provisions of this section.~~

608.1 General. Prescriptive compliance. ~~Where buildings are~~ Buildings designed using the prescriptive-based compliance path in accordance with Section 601.3.2, ~~building electrical power and lighting systems shall comply with the provisions of the *International Energy Conservation Code* and the provisions of this section Section 608.~~

Reason: One of the most frequently asked questions about the IgCC is how does its measures and provisions relate to the IECC?

Section 101.2 clearly states that the IgCC is an 'overlay' code, and that the IgCC is not a "standalone" code. But no further guidance is given on how specific measures in the IgCC "overlay" related, or partially related, measures in the IECC.

This proposal uses language similar to that found in ASHRAE 189.1 to define 189.1's relationship to ASHRAE 90.1. By placing this clear direction about the overlay nature of the IgCC into the Application Section 601.3, the proposal is able to delete duplicate language in each of the 60x.1 sections. This existing language is inconsistent between sections and is more ambiguous. The proposal also makes the title of 608.1 consistent with the other parallel sections.

Cost Impact: Will not increase the cost of construction.

GEW5-14: 601.3-EDELSON1046

GEW6-14

601.3, 601.3.1, 601.3.2

Proponent: David Collins, The Preview Group, Inc., representing American Institute of Architects
(dcollins@preview-group.com)

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2.

601.3.1 Performance-based compliance. Buildings designed on a performance basis shall comply with Sections C402.4, C403.2, C404, C405.2, C405.3, C405.4, C405.6 and C405.7 of the *International Energy Conservation Code* and Sections 602, 608.6, 609, 610 and 611.

601.3.2 Prescriptive-based compliance. Buildings designed on a prescriptive basis shall comply with Sections C402, C403, C404 and C405 of the *International Energy Conservation Code* and the requirements of Sections 605, 606, 607, 608, 609, 610 and 611.

Reason: Clarifies the intent that this chapter is used as an overlay to the IECC, explicitly drawing a parallel between the IECC performance path and the IgCC performance path, and between the IECC prescriptive path and the IgCC prescriptive path.

Cost Impact: Will not increase the cost of construction

Analysis: The *International Energy Conservation Code* sections referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Editions will be C402.5, C403.2, C404, C405.2, C405.3, C405.4, C405.5, C405.6 in Section 601.3.1 of this proposal (One of the referenced sections was deleted.) In Section 601.3.2 none of these sections changed for 2015 IECC.

GEW6-14: 601.3.1-COLLINS617

GEW7-14

601.3, 601.3.1, 601.3.2, 601.4

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2.

601.3.1 Performance-based compliance. Buildings designed on a performance basis shall comply with Sections 602, 608.6, 609, and 610 ~~and 611~~.

601.3.2 Prescriptive-based compliance. Buildings designed on a prescriptive basis shall comply with the requirements of Sections 605, 606, 607, 608, 609, and 610 ~~and 611~~.

601.4 Minimum requirements. Buildings shall be provided with metering complying with Section 603, and commissioning complying with Section 611. Where required in accordance with Section 604.1, building shall be provided with automated-demand response complying with Section 604.

Reason: There is no reason to list Section 611 in 601.3.1 and 601.3.2 when it is already listed as a minimum requirement in 601.4, and other "minimum requirements" in 601.4 are not listed in 601.3.1 and 601.3.2.

Cost Impact: Will not increase the cost of construction.

GEW7-14: 601.3.1-BAILEY587

GEW8-14

601.3.1

Proponent: Glenn Heinmiller, Lam Partners Inc., representing International Association of Lighting Designers (glenn@lampartners.com)

Revise as follows:

601.3.1 Performance-based compliance. Buildings designed on a performance basis shall comply with Sections 602, 608.6, 608.7, 608.8, 608.9, 609, 610 and 611.

Reason: The three items added by this proposal should be included in performance-based compliance calculations. 608.7 covers efficiency of transformers and electrical feeders, 608.8 includes fuel-gas lighting systems in energy calculations, and 608.9 expands the scope of exterior lighting efficiency provisions in the IGCC to include all site lighting, not just lighting that is powered through the building's electrical service. The performance path should not provide an exception from these basic efficiency requirements

Cost Impact: Will not increase the cost of construction.

GEW8-14: 601.3.1-HEINMILLER671

GEW9-14

601.3

Proponent: Jim Edelson, New Building Institute, representing New Buildings Institute (edelson8@gmail.com)

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2, and with not less than two of the following sections: C406.2, C406.3, C406.4, C406.6 and C406.7 of the *International Energy Conservation Code*. Tenant spaces shall comply with Section C406.1.1, of the *International Energy Conservation Code*.

Reason: The modeled performance compliance path in the IgCC requires a 10% performance improvement over the IECC. However, there are questions about whether the prescriptive path offers equivalent savings. For example, the prescriptive path does not require an efficiency improvement for HVAC equipment above federal minimum standards and does not require reductions in LPD. Additionally, the updates to the 2015 edition of the IECC have absorbed some IgCC prescriptive requirements from the 2012 IgCC, narrowing the performance gap even more. Though the IgCC prescriptive path has not been modeled to the best of our knowledge, it is difficult to believe that the prescriptive path in the IgCC delivers the same level of efficiency as the modeled performance path, making it a compliance loophole.

One of the important changes approved for the 2015 IECC increased the number of packages in Section 406 from three to six. The energy savings of the IgCC prescriptive path can be enhanced by using this existing code language in the IECC. In the 2015 IECC, buildings must comply with one of six packages from section 406 of the IECC. This proposal improves the efficiency of the IgCC prescriptive path by requiring buildings to comply with no less than 2 packages. Because the renewable measure in Section C406.5 is already largely required by Section 610 of the IgCC, there are five packages to select from. This proposal will allow the prescriptive path of the IgCC to deliver a higher level of efficiency more closely equivalent to the modeled performance path. Tenant spaces which generally have less flexibility in their construction options are able to use the tenant provisions of the IECC.

Cost Impact: Will increase the cost of construction

Analysis: The International Energy Conservation Code sections referenced in the text of this proposal are section numbers for the 2015 Edition. Section C406 of the IECC was substantially revised and this proposal addresses the 2015 provisions.

GEW9-14: 601.3-EDELSON1121

GEW10-14

604, 611, 601.4

Proponent: Gary Klein, Affiliated International Management LLC, representing self (gary@aim4sustainability.com); Craig Conner (craig.conner@mac.com)

Revise as follows:

601.4 Minimum requirements. Buildings shall be provided with metering complying with Section 603., and commissioning complying with Section 611. ~~Where required in accordance with Section 604.1, building shall be provided with automated demand response complying with Section 604.~~

~~604 AUTOMATED DEMAND RESPONSE (AUTO-DR) INFRASTRUCTURE~~

~~611 ENERGY SYSTEMS COMMISSIONING AND COMPLETION~~

Reason: The purpose of this proposal is to remove provisions that are duplicative of the IECC or are overly complex. The intent of the proposal is to completely delete Sections 604 and 611.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GEW10-14: 601.4- KLEIN1194

GEW 11-14

601.5, 601.5.1, 601.5.2

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner (craig.conner@mac.com)

Delete without substitution:

~~**601.5 Multiple buildings on a site and mixed use buildings.** Where there is more than one building on a site and where a building has more than one use in the building, each building or each portion of a building associated with a particular use shall comply with Sections 601.5.1 or 601.5.2 or a combination of both.~~

~~**601.5.1 Multiple buildings on a site.** For building sites with multiple buildings, the energy use associated with the building site shall be assigned on a proportional basis to each building based on total gross floor area of each building in relation to the total gross floor area of all buildings on the building site. —~~

~~Where energy is derived from either renewable or waste energy, or both sources located on the building site, within individual buildings, or on individual buildings and delivered to multiple buildings, the energy so derived shall be assigned on a proportional basis to the buildings served based on building gross floor area. Energy delivered from renewable and waste energy sources located on or within a building shall be assigned to that building.~~

~~**Exception:** Where it can be shown that energy to be used at the building site is associated with a specific building, that energy use shall be assigned to that specific building.~~

~~**601.5.2 Mixed use buildings.** Where buildings have more than one use, the energy use requirements shall be based on each individual occupancy.~~

Reason: The concepts behind the provisions in these sections are already included in the IECC.

Cost Impact: Will not increase the cost of construction. The proposal removes redundant provisions.

GEW 11-14: 601.5-KLEIN119

GEW12-14

601.5.1

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Revise as follows:

601.5.1 Multiple buildings on a site. For building sites with multiple buildings, the energy use associated with the building site shall be assigned on a proportional basis to each building based on total ~~gross~~ net floor area of each building in relation to the total ~~gross~~ net floor area of all buildings on the building site.

Where energy is derived from either renewable or waste energy, or both sources located on the building site, within individual buildings, or on individual buildings and delivered to multiple buildings, the energy so derived shall be assigned on a proportional basis to the buildings served based on building ~~gross~~ net floor area. Energy delivered from renewable and waste energy sources located on or within a building shall be assigned to that building.

Exception: Where it can be shown that energy to be used at the building site is associated with a specific building, that energy use shall be assigned to that specific building.

Reason: Large campuses will often have dedicated "energy" buildings which contain centralized district heating and district cooling system equipment. These buildings contain little or no net floor area, but can contain large gross floor areas. It makes more sense that energy used and renewable energy generated would be distributed across a multi-building site based on net floor area rather than gross floor area so that energy is attributed to building spaces where energy is used, not the central heating and cooling plants which are serving those spaces.

Furthermore, *net floor area* is a defined term in this code, but "gross floor area" is not.

Cost Impact: Will not increase the cost of construction.

GEW12-14:601.5.1 #1-BAILEY588

GEW13-14

601.5.1

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Revise as follows:

601.5.1 Multiple buildings on a site. For building sites with multiple buildings, the energy use associated with the building site shall be assigned on a proportional basis to each building based on total gross floor area of each building in relation to the total gross floor area of all buildings on the building site.

Where energy is derived from either renewable or waste energy, or both sources located on the building site, ~~within individual buildings, or on~~ in individual buildings and delivered to multiple buildings, the energy so derived shall be assigned on a proportional basis to the buildings served based on building gross floor area. ~~Energy delivered from renewable and waste energy sources located on or within a building shall be assigned to that building.~~

Exception: Where it can be shown that energy to be used at the building site is associated with a specific building, that energy use shall be assigned to that specific building.

Reason: Editorial. The intent of the first sentence seems clear, but the wording is confusing. The last sentence appears to directly contradict the first sentence, and should be deleted.

Cost Impact: Will not increase the cost of construction.

GEW13-14:601.5.1 #2-BAILEY589

GEW14-14

601.6 (New)

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Brickfield, Burchette, Ritts & Stone (gas@bbrslaw.com); Brian Dean (Brian.Dean@icfi.com); William Prindle (william.prindle@icfi.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello (misuriello@verizon.net)

Add new text as follows:

601.6 Maximum envelope values under all compliance methods. Regardless of the method of compliance with this code, the area-weighted average U- factor, C-factor, F-factor and SHGC values applicable to each component of the building envelope shall not exceed by more than 10 percent the values specified in Tables C402.1.2 and C402.3 of the *International Energy Conservation Code*.

Reason: This proposal promotes energy conservation and environmental stewardship by adding a reasonable mandatory backstop for thermal envelope measures. The thermal envelopes of buildings designed and constructed today may be in existence for 100 years or more. Over the building's useful life, there will be regular changes in lighting, heating and cooling equipment, and other measures that can be accomplished without disturbing the building shell. However, the passive components of the thermal envelope – such as insulation – are likely to remain unchanged for much longer periods of time.

The IGCC is designed to enhance sustainability at all phases of the building – from design and construction to additions and alterations to removal and demolition. Buildings properly designed and constructed today will require fewer alterations in the future – and will result in lower impacts on the environment. This is why the most permanent elements of the building – components of the thermal envelope – must be built to a level of efficiency that will not be a burden to later owners and operators of the building.

The new section 601.6 we are proposing will apply an area-weighted cap or limit on the use of thermal envelope components to ensure prudent levels of performance are achieved by each envelope component in all buildings. Specifically, this new section allows each component to exceed the prescriptive requirements of the IGCC by roughly 20% (the current IGCC requires a 10% improvement over the IECC values; this proposal allows trade-offs of envelope values up to 10% higher than what the IECC allows). This approach will allow substantial trade-off flexibility while still ensuring that all envelope measures will exceed some reasonable level of performance.

The buildings designed and constructed today will be a part of the urban landscape for generations to come. It is important that the permanent envelope of each new building meets a level of efficiency within a reasonable range of the IGCC's envelope requirements.

Cost Impact: Will increase the cost of construction

Analysis: The International Energy Conservation Code tables referenced in the text of this proposal are numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the table numbers for the 2015 Editions will be C402.1.4 and C402.4

GEW14-14:601.6 (NEW)-STONE916

GEW15-14

602, 602.1, 602.1.1, A106

Proponent: David Collins, The Preview Group, Inc., representing American Institute of Architects (dcollins@preview-group.com)

Revise as follows:

602 MODELED PERFORMANCE PATHWAY REQUIREMENTS PERFORMANCED-BASED COMPLIANCE

602.1 Performance-based compliance. Compliance for buildings and their sites to be designed on a performance basis shall be determined by predictive modeling of both energy performance and CO₂e emissions. Predictive energy modeling shall use source energy kBtu/sf-y unit measure based on compliance with Section 602.1.1 and CO₂e emissions in Section 602.3. Where a building has mixed uses, all uses shall be included in the performance-based compliance Section 602.1.2. Predictive CO₂e emissions modeling shall be in accordance with Section 602.2.

602.1.1 zEPI. Performance-based designs shall demonstrate a zEPI of not more than 54 50 as determined in accordance with Equation 6-1 for energy use reduction and shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.

$$zEPI = 57 \times (EUI_p/EUI) \quad \text{(Equation 6-1)}$$

where:

EUI_p = the proposed energy use index in source kBtu/sf-y for the proposed design of the building and its site calculated in accordance with Section 602.1.2.

EUI = the base annual energy use index in source kBtu/sf-y for a baseline building and its site calculated in accordance with Section 602.1.2.

57 = a fixed value establishing the relationship between EUI and EUI_p and the maximum zEPI.

**TABLE A106
ENERGY CONSERVATION AND EFFICIENCY**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 10 to establish the minimum total number of project electives that must be satisfied.	—
A106.1	zEPI reduction project electives	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	Project zEPI is at least 5 points lower than required by Table 302.1	<input type="checkbox"/> 1 elective
A106.1	Project zEPI is at least 10 points lower than required by Table 302.1	<input type="checkbox"/> 2 electives
A106.1	Project zEPI is at least 15 points lower than required by Table 302.1	<input type="checkbox"/> 3 electives
A106.1	Project zEPI is at least 20 points lower than required by Table 302.1	<input type="checkbox"/> 4 electives
A106.1	Project zEPI is at least 25 points lower than required by Table 302.1	<input type="checkbox"/> 5 electives
A106.1	Project zEPI is at least 30 points lower than required by Table 302.1	<input type="checkbox"/> 6 electives
A106.1	Project zEPI is at least 35 points lower than required by Table 302.1	<input type="checkbox"/> 7 electives
A106.1	Project zEPI is at least 40 points lower than required by Table 302.1	<input type="checkbox"/> 8 electives

A106.1	Project zEPI is at least 45 points lower than required by Table 302.1	<input type="checkbox"/> 9 electives
A106.1	Project zEPI is at least 54 <u>50</u> points lower than required by Table 302.1	<input type="checkbox"/> 10 electives
A106.2	Mechanical systems project elective	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.3	Service water heating	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.4	Lighting systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.5	Passive design	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—5 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—10 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—20 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No

Reason: zEPI is a critical piece of the goals included in the IgCC that focuses the energy performance of buildings and sites on achieving a zero net energy design for buildings. Simply replacing it with a percentage ignores that concept and as everyone knows reductions by a percentage never get you there. zEPI points to a unit on a scale that goes from a theoretical 100 to zero where 100 equal actual performance for existing buildings as identified in the CBECS data based and 57 equals the 2012 IECC.

The 57 on that scale is a fixed number which was assumed as part of the 2012 IgCC to equate to the performance of the 2012 IECC energy performance. The 50 represents a 10% reduction from what the IECC would allow. To truly get to a zero energy performance goal will require adjusting zEPI each code cycle. This change indicates that zEPI should be adjusted to 50, which would lead to steps as follows:

2015 - zEPI = 50
2018 - zEPI = 40
2021 - zEPI = 30
2024 - zEPI = 20
2027 - zEPI = 10
2030 - zEPI = 0

We believe that communities which wish to achieve zero energy design buildings are looking to this code for that approach to clearly be outlined and included in the code.

In addition, a change to Table A106 has been modified to be consistent with this change.

Cost Impact: Will not increase the cost of construction.

GEW15-14: 602-COLLINS618

GEW16-14

602.1.1, 602.1.2

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Revise as follows:

602.1.1 zEPI. Performance-based designs shall demonstrate a zEPI of not more than 51 as determined in accordance with Equation 6-1 for energy use reduction and shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.

$$zEPI = 57 \times (EUI_p/EUI) \quad \text{(Equation 6-1)}$$

where:

EUI_p = the proposed annual energy use index in source kBtu/sf-y for the proposed design of the building and its site calculated in accordance with Section 602.1.2.

EUI = the base annual energy use index in source kBtu/sf-y for a baseline building and its site calculated in accordance with Section 602.1.2.

602.1.2 ~~Base-annual~~ Annual energy use index. The base and proposed annual energy use index (~~EUI_p~~) of the building and building site shall be calculated in accordance with Equation 6-1 and Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through 602.1.2.3. The annual energy use shall include all energy used for building functions and its anticipated occupancy.

Reason: Editorial. Section 602.1.2 is used to determine both the base and the proposed annual energy use index. The word "annual" is added to EUI_p for clarity.

Cost Impact: Will not increase the cost of construction.

GEW16-14: 602.1.1-BAILEY624

GEW17-14

602.1.2

Proponent: David Collins, The Preview Group, Inc., representing American Institute of Architects (dcollins@preview-group.com)

Revise as follows:

602.1.2 Base annual Annual energy use index indices. The proposed energy use index (EUIp) and the base energy use index (EUI) of the building and building site shall be calculated in accordance with ~~Equation 6-1 and~~ Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through ~~602.1.2.3~~ 602.1.2.2. The annual energy use shall include all energy used for building and building site functions and ~~its~~ anticipated occupancy.

Reason: This proposal seeks to clarify that this Section directs the user to perform modeling for both the proposed and base project designs using the Appendix G of ASHRAE 90.1, as modified

Cost Impact: Will not increase the cost of construction.

GEW17-14: 602.1.2-COLLINS693

GEW18-14

602.1.2, 602.1.2.2

Proponent: Neil Leslie, Gas Technology Institute, representing self
(neil.leslie@gastechnology.org)

Revise as follows:

602.1.2 Base annual Annual energy use index calculation. ~~The proposed energy use index (EUIp) of the building and building site and EUI shall be calculated in accordance with Equation 6-1 and Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through 602.1.2.3. The annual energy use shall include all energy used for building functions and its anticipated occupancy.~~

602.1.2.2 Electric power. In calculating EUIp and EUI ~~the annual energy use index~~, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

**TABLE 602.1.2.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE^a**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas	1.09
Fuel Oil	1.13
LPG	1.12

a. Source: Gas Technology Institute Source Energy and Emissions Analysis Tool.

Reason: Increases clarity and simplifies language.

Cost Impact: Will not increase the cost of construction.

GEW18-14: 602.1.2-LESLIE975

GEW19-14

602.1.2.3

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Revise as follows:

602.1.2.3 Nonrenewable energy. In calculating the annual energy use index for fuel other than electrical power, energy use shall be converted to consistent units by ~~multiplying~~ converting the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2. The conversion factor for energy sources not included in Table 602.1.2.2 shall be 1.1. Conversion factors for purchased district heating shall be 1.35 for hot water and 1.45 for steam. The conversion factor for district cooling shall be 0.33 times the value in Table 602.1.2.1 based on the EPA eGRID Sub-region in which the building is located.

Reason: Editorial. Fuel use needs to be converted to units of energy BTU's before multiplying by the conversion factor.

Cost Impact: Will not increase the cost of construction.

GEW19-14: 602.1.2.3-BAILEY625

GEW20-14

602.1.3

Proponent: David Collins, Preview Group, representing American Institute of Architects
(dcollins@preview-group.com)

Delete without substitution:

~~**602.1.3 Registered design professional in responsible charge of building energy simulation.** For purposes of this section, and where it is required that documents be prepared by a *registered design professional*, the *code official* is authorized to require the owner to engage and designate on the building permit application a *registered design professional* who shall act as the registered design professional in responsible charge of building energy simulation. Modelers engaged by the registered design professional in responsible charge of building energy simulation shall be certified by an *approved accrediting entity*. Where the circumstances require, the owner shall designate a substitute registered design professional in responsible charge of building energy simulation who shall perform the duties required of the original registered design professional in responsible charge of building energy simulation. The *code official* shall be notified in writing by the owner whenever the registered design professional in responsible charge of building energy simulation is changed or is unable to continue to perform the duties.~~

Reason: The requirement for a registered design professional in responsible charge is a defined term and is recognized in practice. Adding to the term a qualifier for energy modeling adds a level of complexity that isn't recognized in any form by a sanctioning body and adds confusion to the professions.

Cost Impact: Will not increase the cost of construction.

GEW20-14: 602.1.3-COLLINS697

GEW 21-14

602.2

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Revise as follows:

602.2 Annual direct and indirect CO₂e emissions. The CO₂e emissions calculations for the building and building site shall be determined in accordance with Sections 602.2.1 and 602.2.2. The emissions associated with the proposed design shall be less than or equal to the CO₂e emissions associated with the standard reference design in accordance with Equation 6-2.

$$\text{CO}_2e_{pd} \geq (\text{zEPI} \times \text{CO}_2e_{srbd})/57 \quad \text{(Equation 6-2)}$$

$$\text{CO}_2e_{pd} \leq (\text{zEPI} \times \text{CO}_2e_{srbd})/57 \quad \text{(Equation 6-2)}$$

where:

zEPI = ~~the minimum score~~ determined in accordance with Section 602.1.1.

CO₂e_{pd} = emissions associated with the proposed design.

CO₂e_{srbd} = emissions associated with the standard reference budget design in accordance with Section 602.1.2.

Reason: Editorial. The proposal changes the "greater than or equal to" sign in the current equation to "less than or equal to". As stated in 602.2, the emissions associated with the proposed design should be less than the emissions associated with the reference design.

Cost Impact: Will not increase the cost of construction.

GEW21-14: 602.2-BAILEY623

GEW22-14

602.2

Proponent: Neil Leslie, Gas Technology Institute, representing self
(neil.leslie@gastechnology.org)

Revise as follows:

602.2 Annual direct and indirect CO₂e emissions. The CO₂e emissions calculations for the building and building site shall be determined in accordance with Sections 602.2.1 and 602.2.2. The emissions associated with the proposed design shall be less than or equal to the CO₂e emissions associated with the standard reference design in accordance with Equation 6-2.

$$\text{CO}_2\text{e pd} \leq (\text{zEPI} \times \text{CO}_2\text{e srbd}) \times 51/57 \quad \text{(Equation 6-2)}$$

where:

zEPI = the minimum score in accordance with Section 602.1.1.

CO₂e pd = emissions associated with the proposed design.

CO₂e srbd = emissions associated with the standard reference budget design in accordance with Section 602.1.2.

Reason: Corrects two errors in equation:

The proposed design CO₂e emissions for compliance need to be less than or equal to the standard reference budget design emissions, not greater than or equal to.

The direct linkage to the proposed design zEPI results in a variable rather than fixed emission compliance requirement for the building. If the proposed design has a zEPI of 51, the equation will be consistent with the zEPI energy performance for minimum compliance. However, at all other compliant proposed design zEPI values the CO₂e emissions compliance requirement will be too stringent. Using the ratio of 51/57 correctly sets a fixed baseline compliance requirement based on the standard reference energy consumption adjusted for the code minimum energy performance level requirement.

Cost Impact: Will not increase the cost of construction.

GEW22-14: 602.2-LESLIE849

GEW23-14

602.1, 602.1.1, 602.1.2, 602.1.2.1, Table 602.1.2.1, 602.1.2.2, Table 602.1.2.2, 602.1.2.3

Proponent: Charles Foster, Steffes Corporation, representing self (cfoster20187@yahoo.com)

Revise as follows:

602.1 Performance-based compliance. Compliance for buildings and their sites to be designed on a performance basis shall be determined by predictive modeling. Predictive modeling shall use ~~source site~~ energy kBtu/sf-y unit measure based on compliance with Section 602.1.1 and CO₂e emissions in Section 602.3. Where a building has mixed uses, all uses shall be included in the performance-based compliance.

602.1.1 zEPI. Performance-based designs shall demonstrate a zEPI of not more than 51 as determined in accordance with Equation 6-1 for energy use reduction and shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.

$$zEPI = 57 \times (EUI_p/EUI) \quad \text{(Equation 6-1)}$$

where:

EUI_p = the proposed energy use index in ~~source site~~ kBtu/sf-y for the proposed design of the building and its site calculated in accordance with Section 602.1.2.

EUI = the base annual energy use index in ~~source site~~ kBtu/sf-y for a baseline building and its site calculated in accordance with Section 602.1.2.

602.1.2 Base annual energy use index. The proposed energy use index (EUI_p) of the building and building site shall be calculated in accordance with Equation 6-1 ~~and Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through 602.1.2.3.~~ The annual energy use shall include all energy used for building functions and its anticipated occupancy.

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION***

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97
AKMS	ASCC Miscellaneous	4.76
ERCT	ERCOT All	2.93
FRCC	FRCC All	2.97
HIMS	HICC Miscellaneous	3.82
HIOA	HICC Oahu	3.14
MORE	MRO East	3.40
MROW	MRO West	3.41

eGRID-2007-SUB-REGION-ACRONYM	eGRID-2007-SUB-REGION-NAME	ENERGY CONVERSION FACTOR
NYLI	NPCC-Long-Island	3.20
NEWE	NPCC-New-England	3.01
NYCW	NPCC-NY/Westchester	3.32
NYUP	NPCC-Upstate-NY	2.51
RFCE	RFC-East	3.15
RFCM	RFC-Michigan	3.05
RFCW	RFC-West	3.14
SRMW	SERC-Midwest	3.24
SRMV	SERC-Mississippi-Valley	3.00
SRSO	SERC-South	3.08
SRTV	SERC-Tennessee-Valley	3.11
SRVC	SERC-Virginia/Carolina	3.13
SPNO	SPP-North	3.53
SPSO	SPP-South	3.05
CAMX	WECC-California	2.61
NWPP	WECC-Northwest	2.26
RMPA	WECC-Rockies	3.18
AZNM	WECC-Southwest	2.95

a. Sources: EPA eGrid2007 version 1.1, 2005 data; EPA eGrid regional gross-grid loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.1.2.2 Electric power. In calculating the annual energy use index, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

**TABLE 602.1.2.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE^a**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas	1.09
Fuel Oil	1.13
LPG	1.12

a. Source: Gas Technology Institute Source Energy and Emissions Analysis Tool.

602.1.2.3 Nonrenewable energy. In calculating the annual energy use index for fuel other than electrical power, energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2. The conversion factor for energy sources not included in Table 602.1.2.2 shall be 1.1. Conversion factors for purchased district heating shall be 1.35 for hot water and 1.45 for steam. The

conversion factor for district cooling shall be 0.33 times the value in Table 602.1.2.1 based on the EPA eGRID Sub-region in which the building is located.

Reason: These suggested edits would help to streamline the IgCC and improve the accounting of energy usage in Chapter 6.

They would also make the IgCC easier to understand, easier to enforce, easier to measure, easier to verify performance, and make the code consistent with ASHRAE Standard 189.1, which uses site energy metrics.

In addition, this proposal would bring that will be in line with the agreement between ASHRAE, USGBC, AIA, and IESNA.

Although zEPI is a relatively new concept and has not been used in any other enforceable building code, it offers promise so far as tracking the energy efficiency performance of buildings towards a goal of "net zero." In the first publication of the IgCC, the code used a version of ZEPI that required users to convert calculated annual site energy consumption into "source energy" units. However, ZEPI works with any consistent energy unit input, whether it be site or source energy units.

This proposal would eliminate the extra steps involved in converting site to source energy and would make the process more consistent with ICC affiliates that have consciously chosen to use site energy metrics.

For example, the conclusion by a panel of experts that published the ASHRAE *Report of the Technology Council Ad Hoc Committee on Energy Targets* (June 2010) concluded:

"The Vision 2020 Ad Hoc also realized that in order to make such a vision a reality, they would need to define a single meaning for net-zero energy building. The conclusion they reached is supported by this Energy Targets Ad Hoc. Quoting from the Vision 2020 report:

'Ultimately, the only way to measure if a building is a NZEB is to look at the energy crossing the boundary. Other definitions, including source, emissions, and cost, are based on this measured information and include weighting factors and algorithms to get to the metric of interest. Because of the complications involved in making these computations, **site energy measurements** have been chosen through an agreement of understanding between ASHRAE, the American Institute of Architects (AIA), the U.S. Green Building Council (USGBC), and the Illuminating Engineering Society of North America (IESNA).'

In addition, in a report entitled *DOE Commercial Building Energy Asset Rating Program Focus Groups with Primary Stakeholders in Seattle*, in a series of focus groups convened by the U.S. Department of Energy, a primary conclusion was that users of building performance data preferred site energy to source energy. One of the key findings of the Report was:

"Including site versus source energy use was confusing or did not provide value. Site information was preferred by most stakeholders.

In another part of the report it stated:

"Comparing site energy use versus source energy use is confusing or does not provide value. Page 1 of the asset rating report compared site energy use and source energy use. Several building stakeholders did not find the source energy use information helpful because they are more concerned with site energy. For example, one participant commented "*When I first looked at this in trying to figure out what it all meant, I ended up just focusing on the "site energy use," I mean, thinking that the "source energy use" really wasn't going to be on anyone's high priority list of evaluations when they're looking at buying a building.*" And another participant has this to say about source information: "*As a building owner...do I really care about source energy use? ...I'm just more focused on what's it costing me.*" In addition, a few building stakeholders were confused by source energy and did not understand the purpose of presenting the information."

Furthermore, there have been significant changes in energy production since 2005 (more renewable electricity production, more hydraulic fracturing of shale gas, more deepwater drilling and oil sands production of fuel oil) which is not captured in any of the current Chapter 6 table estimates. In addition, no projected estimates are shown for the years 2015 and beyond. These values are not static, and to knowing use significantly incorrect as well as static estimates will create situations that contradict the purpose of this code (e.g., building designers selecting energy types such as fuel oil with a lower source estimate than electricity will lead to many non-green buildings that will increase the amount of oil imports).

Bibliography:

1. DOE CBAR Asset Rating Program focus groups:

http://apps1.eere.energy.gov/buildings/publications/pdfs/commercial_initiative/asset_rating_s_eattle_focus_groups.pdf

2. ASHRAE Tech Council June 2010 report:

http://www.tc76.org/docs/Energy_Targets_Report_2010-06-22.pdf

3. Fossil fuel upstream source energy estimates and emissions information:

<http://www.netl.doe.gov/energy-analyses/pubs/NG-GHG-LCI.pdf>

<http://www.pnas.org/content/early/2011/10/13/1107409108.full.pdf>

http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_6_Fugitive_Emissions_from_Oil_and_Natural_Gas.pdf

https://circabc.europa.eu/d/d/workspace/SpacesStore/db806977-6418-44db-a-64-20267139b34d/Brandt_Oil_Sands_GHGs_Final.pdf

<http://www.nytimes.com/2011/09/27/business/energy-environment/in-north-dakota-wasted-natural-gas-flickers-against-the-sky.html?pagewanted=all>

<http://www.investmentu.com/2011/September/natural-gas-flaring.html>

Cost Impact: Will not increase the cost of construction.

GEW23-14: 602.1-FOSTER456

GEW24-14

602, 602.1, 602.1.1, 602.1.2, 602.1.2.1, Table 602.1.2.1, 602.1.2.2, Table 602.1.2.2, 602.1.2.3, 602.1.3, 602.2, 602.2.1, 602.2.2, Table 602.2.2, 602.2.3

Proponent: Maureen Guttman, Building Codes Assistance Project, representing Building Codes Assistance Project (mguttman@ase.org)

Revise as follows:

602 MODELED PERFORMANCE PATHWAY REQUIREMENTS PERFORMANCE-BASED COMPLIANCE

602.1 Performance-based compliance. Compliance for buildings and their sites to be designed on a performance basis shall be determined by predictive modeling of both energy performance and CO₂e emissions. Predictive energy modeling shall use source energy kBtu/sf-y unit measure based on compliance with Section 602.1.1 and CO₂e emissions in Section 602.3. ~~Where a building has mixed uses, all uses shall be included in the performance-based compliance Section 602.2. Predictive CO₂e emissions modeling shall be in accordance with Section 602.3.~~

~~602.1.1 zEPI~~ **602.2 Energy performance modeling.** Performance-based designs shall demonstrate a zEPI of not more than 57 as determined in accordance with Equation 6-1 for energy use reduction and shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.

$$zEPI = 57 \times \left(\frac{\text{Proposed building performance}}{\text{Baseline building performance}} \right) \left(\frac{EUI_p}{EUI} \right) \quad \text{(Equation 6-1)}$$

where:

~~EUI_p = the proposed energy use index in source kBtu/sf-y for the proposed design of the building and its site calculated in accordance with Section 602.1.2.~~

~~EUI = the base annual energy use index in source kBtu/sf-y for a baseline building and its site calculated in accordance with Section 602.1.2.~~

Proposed Building Performance = The proposed building performance in source kBtu for the proposed design of the building and its site calculated in accordance with Section 602.2.1.

Baseline Building Performance = The baseline building performance in source kBtu for a baseline building and its site calculated in accordance with Section 602.2.1.

57 = A fixed value representing the performance of a baseline building designed to comply with the 2012 International Energy Conservation Code.

602.1.2 Base annual energy use index. 602.2.1 Modeling methodology. The proposed energy use index (EUI_p) ~~building performance and the baseline building performance of the building and building site shall be calculated in accordance with Equation 6-1 and Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through 602.1.2.3~~ Section 602.2.1.1 and Section 602.2.1.2. The annual energy use modeling shall include all energy used for building and site functions and its anticipated occupancy.

~~602.1.2.1.602.2.1.1 Modifications to Appendix G of ASHRAE 90.1~~ **Energy units.** The performance rating ~~building performance calculations~~ in Section G1.2 G3 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost. Energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.2 based on the geographical location of the building.

**TABLE ~~602.1.2.1~~ 602.2.1.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA**

(portions of table not shown remain unchanged)

~~602.1.2.2 Electric power~~ 602.2.1.2 Site to source electric power conversion. In calculating the annual energy use index the proposed building performance and the baseline building performance, electric energy used shall be calculated in source energy consistent units by ~~converting~~ multiplying the electric power use at the utility meter or measured point of delivery to in Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

~~602.1.2.3 Nonrenewable energy~~. In calculating the annual energy use index for fuel other than electrical power, energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2. The conversion factor for energy sources not included in Table 602.1.2.2 shall be 1.1. Conversion factors for purchased district heating shall be 1.35 for hot water and 1.45 for steam. The conversion factor for district cooling shall be 0.33 times the value in Table 602.1.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE ~~602.1.2.2~~ 602.2.1.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE^a**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas ^a	1.09
Fuel Oil ^a	1.13
LPG ^a	1.12
<u>Purchased District Heating - Hot Water</u>	<u>1.35</u>
<u>Purchased District Heating - Steam</u>	<u>1.45</u>
<u>District Cooling</u>	<u>0.33 x value in Table 602.1.2.1</u>
<u>Other</u>	<u>1.1</u>

a. Source: Gas Technology Institute Source Energy and Emissions Analysis Tool.

~~602.1.3 Registered design professional in responsible charge of building energy simulation~~. For purposes of this section, and where it is required that documents be prepared by a *registered design professional*, the *code official* is authorized to require the owner to engage and designate on the building permit application a *registered design professional* who shall act as the registered design professional in responsible charge of building energy simulation. Modelers engaged by the registered design professional in responsible charge of building energy simulation shall be certified by an *approved* accrediting entity. Where the circumstances require, the owner shall designate a substitute registered design professional in responsible charge of building energy simulation who shall perform the duties required of the original registered design professional in responsible charge of building energy simulation. The *code official* shall be notified in writing by the owner whenever the registered design professional in responsible charge of building energy simulation is changed or is unable to continue to perform the duties.

~~602.2 Annual direct and indirect CO₂e emissions~~ 602.3 CO₂e emissions modeling. The CO₂e emissions calculations for the proposed and baseline building and building site shall be determined based on the proposed and baseline building performance calculated in accordance with Sections 602.2.1 and 602.2.2 as modified by Sections 602.3.1 and 602.3.2. The emissions associated with the proposed

design shall be less than or equal to the CO₂e emissions associated with the standard reference design in accordance with Equation 6-2.

$$CO_2e_{pd} \geq (zEPI \times CO_2e_{rbd})/57 \tag{Equation 6-2}$$

where:

zEPI = the minimum score in accordance with Section 602.1.4 602.2.

CO₂e_{pd} = emissions associated with the proposed design building performance.

CO₂e_{rbd} = emissions associated with the standard reference budget design baseline building performance in accordance with Section 602.1.2.

57 = A fixed value representing CO₂e emissions of a baseline building designed to comply with the 2012 International Energy Conservation Code.

602.2.4 602.3.1 Onsite CO₂e emissions from electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWhs, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

602.2.2 602.3.2 Onsite nonrenewable energy. Emissions associated with the use of nonrenewable energy sources other than electrical power such as natural gas, fuel oil, and propane shall be calculated by multiplying the fossil fuel energy used by the building and its site at the utility meter by the national emission factors in Table 602.2.2 and the conversions required by this section. Emissions associated with fossil fuels not specified in Table 602.2.2 shall be calculated by multiplying the fossil fuel used by the building at the utility meter by 250. Emissions associated with purchased district energy shall be calculated by multiplying the energy used by the building at the utility meter by 150 for hot water and steam, and for district cooling shall be calculated by multiplying by the factors from Table 602.2.2 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.2 602.3.2
FOSSIL FUEL EMISSION FACTORS**

EMISSION RATE (lb/MMBtu HHV)	NATURAL GAS AS STATIONARY FUEL	FUEL OIL AS STATIONARY FUEL	PROPANE AS STATIONARY FUEL
CO ₂ e	137.35	200.63	162.85

For SI: MMBtu = 1,000,000 Btu = 10 terms; HHV = High-heating value.

**TABLE 602.3.2
FOSSIL FUEL EMISSION FACTORS**

STATIONARY FUEL TYPE	EMISSION FACTOR
Natural Gas	13.7.35
Fuel Oil	200.63
Propane	162.85
Other Fossil Fuels	250.00
Purchased District Energy – Hot water and steam	150.00

For SI: MMBtu – 1,000,000 Btu = 10 terms; HHV = High-heating value.

602.2.3 Annual direct and indirect CO₂e emissions associated with onsite use of fossil fuels and purchased district energy. Emissions associated with the use of natural gas, fuel oil and, propane shall be calculated by multiplying the natural gas, fuel oil, and propane delivered to the building at the utility meter by the corresponding emission factors in Table 602.2.2. Emissions associated with fossil fuels not listed shall be calculated by multiplying the fossil fuel delivered to the building at the utility meter by 250.

~~Emissions associated with purchased district heating shall be calculated by multiplying the heating energy delivered to the building at the utility meter by 150 for hot water and steam, and for district cooling, the factors from Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.~~

Reason: This proposal clarifies and simplifies Section 602 of the IgCC by cleaning up language, reorganizing the sections, and reducing the zEPI calculation to the basic required units.

602.1 This Section clearly states that modeling shall produce information on both energy performance and CO2e emissions, and changes the energy units from kBtu/sf-y to kBtu.

602.1.1 (new 602.2) This proposal is a modification on that submitted by the American Institute of Architects. Instead of using EUI and EUIp, this proposal uses the units and language that are found in ASHRAE Appendix G for clarity and consistency. The EUI concept is not forsaken, but the need to divide the energy use by building area is an unnecessary complication, since the baseline building and proposed building will be exactly the same. Furthermore, it is unnecessary to specify that the energy use is "annual", since whatever measure of time is used must be consistent for both the baseline and proposed calculations.

We agree with AIA that zEPI is a critical piece of the goals included in the IgCC that focuses the energy performance of buildings and sites on achieving a zero net energy design for buildings. zEPI points to a unit on a scale that goes from a theoretical 100 to zero where 100 equal actual performance for existing buildings as identified in the 2003 CBECS database and 57 equals the performance level associated with the 2012 IECC.

The 57 on that scale is a fixed number which was assumed as part of the 2012 IgCC to equate to the performance of the 2012 IECC energy performance. The 50 represents a 10% reduction from what the IECC would allow. To truly get to a zero energy performance goal will require adjusting zEPI each code cycle. This change indicates that zEPI should be adjusted to 50, which would lead to steps as follows:

2015 - zEPI = 50
2018 - zEPI = 40
2021 - zEPI = 30
2024 - zEPI = 20
2027 - zEPI = 10
2030 - zEPI = 0

We believe that communities which wish to achieve zero energy design buildings are looking to this code for that approach to clearly be outlined and included in the code.

602.1.2 (new 602.2.1) This Section is renumbered to be a direct subsection of 602.2, in that it builds on the zEPI requirement with further information on how the building performance modeling shall be done. The language is cleaned up to make it clear that the modeling shall be done in accordance with ASHRAE Appendix G as modified.

602.1.2.1 (new 602.2.1.1) The title of this Section did not make sense, as required modifications were identified in multiple Sections. The change to Section G3 of ASHRAE

90.1 refers directly to the modeling methodology, whereas the previously referenced Section G1.2 addressed Performance Rating. This Section also incorporates a provision formerly in Section 602.1.2.3, as it is related to the calculation of energy units.

602.1.2.2 (new 602.2.1.2) The title of this Section is changed to clarify the actual purpose of the Section, which constitutes the second required modification to Appendix G. The language is amended for clarity.

602.1.2.3 is deleted in its entirety. The first sentence of the Section is moved up to Section 602.1.2.1 (new 602.2.1.1), and the other sentences are deleted in favor of providing the information in Table 602.1.2.2 with the other fuel conversion factors.

Table 602.1.2.2 is expanded to include the fuel conversion factors formerly in 602.1.2.3, and the footnote marking is clarified to be applicable only to NG, Fuel Oil, and LPG.

602.1.3 is deleted in its entirety. The requirement for a registered design professional in responsible charge is a defined term and is recognized in practice. Adding to the term a qualifier for energy modeling adds a level of complexity that isn't recognized in any form by a sanctioning body and adds confusion to the professions.

602.2 (new 602.3) is amended to more closely parallel the language in 602.1.1 and 602.1.2 (new 602.2).

The abbreviations used in the calculation are changed to correlate with the definitions provided.

602.2.1 (new 602.3.1) and 602.2.2 (new 602.3.2) The titles are changed for clarity.

Table 602.2.2 (new Table 602.3.2) is replaced to include the emission conversion factors formerly in 602.2.2.

Cost Impact: Will not increase the cost of construction

GEW24-14: 602-GUTTMAN939

GEW25-14

202, 302.1, 302.1.1, 601.3, 601.3.1, 602.1, 602.1.2, 602.1.2.1, 602.1.2.3, 602.2, 602.2.1, 602.2.2, 602.2.3, A106, A106.1

Proponent: Mark Heizer, Oregon Building Codes Division, representing self (mark.r.heizer@gmail.com)

Delete without substitution:

SECTION 202 DEFINITIONS

ZERO ENERGY PERFORMANCE INDEX (zEPI). A scalar representing the ratio of energy performance of the proposed design compared to the average energy performance of buildings relative to a benchmark year.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance.

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. ~~Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.~~
3. 2. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
<u>302.1, 601.3, 602.1</u>	Performance-based compliance: The jurisdiction shall indicate whether performance-based energy compliance, as determined in accordance with Section 602.1 is required for buildings with a total floor area of more than 25,000 square feet.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
302.1, 302.1.1, 601.3, 601.3.1 602.1	zEPI of Jurisdictional Choice — The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance. Enhanced energy performance: Where the jurisdiction intends to require enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a required minimum reduction in net energy use for such buildings. The minimum reduction set by the jurisdiction shall be not less than 5 percent as calculated in accordance with Section 602.1.	Occupancy: _____ zEPI: _____	Minimum Reduction in Net Energy Use: %
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post Certificate of Occupancy zEPI annual energy use, energy demand, and CO ₂ e emissions reporting	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(portions of table not shown remain unchanged)

302.1.1 zEPI of 46 or less. Where a zEPI of 46 or less is indicated by the jurisdiction in Table 302.1, buildings shall comply on a performance basis in accordance with Section 601.3.1.

Exception: Buildings less than 25,000 square feet (2323 m²) in *total building floor area* pursuing compliance on a prescriptive basis shall be deemed to have a zEPI of 51 and shall not be required to comply with the zEPI of Jurisdictional Choice indicated by the jurisdiction in Table 302.1.

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 601.3.1 or Section 601.3.2— except that, where indicated by the jurisdiction under the Chapter 6 provisions of Table 302.1, buildings with a total building floor area of more than 25,000 square feet and their associated building sites shall be designed on a performance basis in accordance with Section 601.3.1

602.1 Performance-based compliance. Compliance for buildings and their sites to be designed on a performance basis shall be determined by predictive modeling. Predictive modeling shall be determined in accordance with Section C407 of the *International Energy Conservation Code*. The proposed design shall not use more energy than the standard reference design. Where indicated under the Chapter 6 provisions of Table 302.1, the proposed design shall further reduce annual energy use by not less than the amount indicated in Table 302.1, as compared to the energy used by the standard reference design. ~~use source energy kBtu/sf-y unit measure based on compliance with Section 602.1.1 and CO₂e emissions in Section 602.3. Where a building has mixed uses, all uses shall be included in the performance-based compliance.~~

602.1.1 zEPI. Performance-based designs shall demonstrate a zEPI of not more than 51 as determined in accordance with Equation 6-1 for energy use reduction and shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.

$$zEPI = 57 \cdot (EUI_p/EUI) \text{ (Equation 6-1)}$$

where:

~~EUI_p = the proposed energy use index in source kBtu/sf-y for the proposed design of the building and its site calculated in accordance with Section 602.1.2.~~

~~EUI = the base annual energy use index in source kBtu/sf-y for a baseline building and its site calculated in accordance with Section 602.1.2.~~

602.1.2 Base annual energy use index. ~~The proposed energy use index (EUI_p) of the building and building site shall be calculated in accordance with Equation 6-1 and Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through 602.1.2.3. The annual energy use shall include all energy used for building functions and its anticipated occupancy.~~

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. ~~The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.~~

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97

AKMS	ASCC-Miscellaneous	1.76
ERCT	ERCOT-All	2.93
FRCC	FRCC-All	2.97
HIMS	HICC-Miscellaneous	3.82
HIOA	HICC-Oahu	3.14
MORE	MRO-East	3.40
MROW	MRO-West	3.41
NYLI	NPCC-Long-Island	3.20
NEWE	NPCC-New-England	3.01
NYCW	NPCC-NYCAWestchester	3.32
NYUP	NPCC-Upstate-NY	2.51
RFGE	RFCEast	3.15
RFCM	RFC-Michigan	3.05
RFCW	RFC-West	3.14
SRMW	SERC-Midwest	3.24
SRMV	SERC-Mississippi-Valley	3.00
SRSO	SERC-South	3.08
SRTV	SERC-Tennessee-Valley	3.11
SRVC	SERC-Virginia/Carolina	3.13
SPNO	SPP-North	3.53
SPSO	SPP-South	3.05
CAMX	WECC-California	2.61
NWPP	WECC-Northwest	2.26
RMPA	WECC-Rockies	3.18
AZNM	WECC-Southwest	2.95

a. Sources: EPA eGrid2007 version 1.1, 2005 data; EPA eGrid regional gross grid loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.1.2.3 Nonrenewable energy. In calculating the annual energy use index for fuel other than electrical power, energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2. The conversion factor for energy sources not included in Table 602.1.2.2 shall be 1.1. Conversion factors for purchased district heating shall be 1.35 for hot water and 1.45 for steam. The conversion factor for district cooling shall be 0.33 times the value in Table 602.1.2.1 based on the EPA eGRID Sub-region in which the building is located.

602.2 Annual direct and indirect CO₂e emissions. The CO₂e emissions calculations for the building and building site shall be determined in accordance with Sections 602.2.1 and 602.2.2. The emissions associated with the proposed design shall be less than or equal to the CO₂e emissions associated with the standard reference design in accordance with Equation 6-2.

$$CO_2e_{pd} \geq (zEPI \times CO_2e_{srbd})/57 \quad \text{(Equation 6-2)}$$

where:

$zEPI$ = the minimum score in accordance with Section 602.1.1.

CO_2e_{pd} = emissions associated with the proposed design.

CO_2e_{srbd} = emissions associated with the standard reference budget design in accordance with Section 602.1.2.

602.2 Annual direct and indirect CO₂e emissions. CO₂e emissions for building and building site for the proposed design shall be less than or equal to the CO₂e emissions for the standard reference design. The CO₂e emissions shall be determined in accordance with Section 7 of ASHRAE 105, utilizing the annual energy use figures from Section 602.1.

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWhs, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB- REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	1270
AKMS	ASCC Miscellaneous	515
ERCT	ERCOT All	4417
FRCC	FRCC All	4416
HIMS	HICC Miscellaneous	1595
HIOA	HICC Oahu	18591
MORE	MRO East	1971
MROW	MRO West	1957
NYLI	NPCC Long Island	1651
NEWE	NPCC New England	999
NYCW	NPCC NYC/Westchester	874
NYUP	NPCC Upstate NY	774
RFCE	RFC East	1224
RFCM	RFC Michigan	1680
RFCW	RFC West	1652
SRMW	SERC Midwest	1966

eGRID-2007 SUB-REGION ACRONYM	eGRID-2007 SUB- REGION NAME	2005-CO ₂ e RATE (lbs/MWh)
SRMV	SERC-Mississippi Valley	1094
SRSO	SERC-South	1601
SRTV	SERC-Tennessee Valley	1623
SRVC	SERC-Virginia/Carolina	1220
SPNO	SPP-North	2106
SPSO	SPP-South	1780
CAMX	WECC-California	768
NWPP	WECC-Northwest	958
RMPA	WECC-Rockies	1999
AZNM	WECC-Southwest	1391

a.Sources: EPA eGRID2007 Version 1.1, 2005 data; EPA eGrid regional-gross-grid-loss-factor.

602.2.2 Onsite nonrenewable energy. Emissions associated with the use of nonrenewable energy sources other than electrical power such as natural gas, fuel oil, and propane shall be calculated by multiplying the fossil fuel energy used by the building and its site at the utility meter by the national emission factors in Table 602.2.2 and the conversions required by this section. Emissions associated with fossil fuels not specified in Table 602.2.2 shall be calculated by multiplying the fossil fuel used by the building at the utility meter by 250. Emissions associated with purchased district energy shall be calculated by multiplying the energy used by the building at the utility meter by 150 for hot water and steam, and for district cooling, the factors from Table 602.2.2 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.2
FOSSIL FUEL EMISSION FACTORS**

EMISSION RATE (lb/MMBtu HHV)	NATURAL GAS AS STATIONARY FUEL	FUEL OIL AS STATIONARY FUEL	PROPANE AS STATIONARY FUEL
CO ₂ e	137.35	200.63	162.85

For SI: MMBtu = 1,000,000 Btu = 10 terms; HHV = High-heating value.

602.2.3 Annual direct and indirect CO₂e emissions associated with onsite use of fossil fuels and purchased district energy. Emissions associated with the use of natural gas, fuel oil and propane shall be calculated by multiplying the natural gas, fuel oil, and propane delivered to the building at the utility meter by the corresponding emission factors in Table 602.2.2. Emissions associated with fossil fuels not listed shall be calculated by multiplying the fossil fuel delivered to the building at the utility meter by 250. Emissions associated with purchased district heating shall be calculated by multiplying the heating energy delivered to the building at the utility meter by 150 for hot water and steam, and for district cooling, the factors from Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

603.3.7 Renewable and waste energy. Equipment and systems providing energy from renewable or waste energy sources which is included in the determination of the building zEPI, annual energy use of the proposed design in accordance with Section 602.1 shall be capable of being metered to allow a

determination of the output of equipment and systems in accordance with Sections 603.3.7.1 through 603.3.7.5.

Revise as follows:

**TABLE A106
ENERGY CONSERVATION AND EFFICIENCY**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 10 to establish the minimum total number of project electives that must be satisfied.	—
A106.1	zEPI Annual net energy use reduction project electives	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	zEPI Annual net energy use is at least 5 points 10 percent lower than required by Table 302.1	<input type="checkbox"/> 1 elective
A106.1	zEPI Annual net energy use is at least 40 points 20 percent lower than required by Table 302.1	<input type="checkbox"/> 2 electives
A106.1	zEPI Annual net energy use is at least 45 points 30 percent lower than required by Table 302.1	<input type="checkbox"/> 3 electives
A106.1	zEPI Annual net energy use is at least 20 points 40 percent lower than required by Table 302.1	<input type="checkbox"/> 4 electives
A106.1	zEPI Annual net energy use is at least 25 points 50 percent lower than required by Table 302.1	<input type="checkbox"/> 5 electives
A106.1	zEPI Annual net energy use is at least 30 points 60 percent lower than required by Table 302.1	<input type="checkbox"/> 6 electives
A106.1	zEPI Annual net energy use is at least 35 points 70 percent lower than required by Table 302.1	<input type="checkbox"/> 7 electives
A106.1	zEPI Annual net energy use is at least 40 points 80 percent lower than required by Table 302.1	<input type="checkbox"/> 8 electives
A106.1	zEPI Annual net energy use is at least 45 points 90 percent lower than required by Table 302.1	<input type="checkbox"/> 9 electives
A106.1	zEPI Annual net energy use is at least 54 points 100 percent lower than required by Table 302.1	<input type="checkbox"/> 10 electives
A106.2	Mechanical systems project elective	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.3	Service water heating	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.4	Lighting systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.5	Passive design	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—5 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—10 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—20 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No

A106.1 zEPI Annual net energy use reduction project electives. Project electives for buildings pursuing performance-based compliance in accordance with Section 601.3.1 shall be in accordance with the portions of Table A106 that reference Section A106.1, ~~Equation 6-4~~ and the calculation procedures specified in Section ~~602.1.602.1.2.1~~.

Add new standard(s) as follows:

ASHRAE

ANSI/ASHRAE 105-2013 Standard Methods of Determining, Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions

Reason: The current zEPI language is difficult to understand, adopt, modify and enforce. The zEPI multiplier requires modification at each adoption cycle to align the zEPI multiplier relative ratio of the efficiency of the current ASHRAE 90.1 (2013) and the baseline "100 level" CBECs building. Otherwise, the path-to-net-zero multiplier is ineffective.

The options for local modification are difficult to understand by an adopting jurisdiction, as well as the method to select the level of enhanced energy performance.

The use of the regional conversion factors further complicate the understanding. And the use of 2005 EIA eGRID data to create the multiplication factors is an outdated method using decade-old view of regional energy use. The 2005 data does not take into account either the substantial increases in renewable energy (wind, solar, etc.) or the phase-out of coal fired power plants. This is the reason that no other sustainable program uses the eGRID regional data for "source energy" and CO₂e reporting. LEED, Energy Star and ASHRAE Standards utilize national source energy figures. IgCC is an international standard and for US energy reporting, national figures (or locally selected figures) should be used.

The intent is to simplify the method for a performance/modeled energy compliance path through **X** steps:

Step 1: Simplify the 302.1 and Table 302.1 methodology for local adoption and selection of "level a modeled/performance design should be above code". The intent of the 2010 IgCC was to allow local jurisdiction to require performance (modeling) path of the design to 10% above the current code (for all structures over 25,000 Sq. Ft.). The % above code could be modified by the local jurisdiction. The revised 302.1 is clearer about how the jurisdiction sets the improvement above code. Current code is unclear on how the zEPI correlates to current code.

Step 2: Use the IECC as the energy code. The IgCC is an overlay code to the I-codes, not ASHRAE 90.1. The modeling of energy performance should be relative to the IECC. IECC C407 is the performance modeling methodology for the I-Codes.

Using ASHRAE 90.1 as the energy code baseline in the current IgCC does not show the building energy performance relative to the IECC, much less if the building is even compliant with the IgCC. If wanting to compare energy performance relative to 90.1, ASHRAE 189.1 is an available compliance path.

Step 3: Section 602 is inordinately complex and uses a proxy that is not substantiated through any energy modeling or other calculation. The zEPI requires updating at every code cycle to match current energy code performance (actually it requires analyzing ASHRAE 90.1). The Equation 6-1 is simplified to require: The design building shall use 10% less energy (or the figure selected by the local jurisdiction) than a baseline IECC building.

Step 4: It also simplifies the emissions reporting methodology. Source energy figures are controversial and are relative to means and methods that are NOT under the control of the building. The current tables with eGRID data will be a full decade out of date when the 2015 IgCC is released. Putting requirements for minimum code compliance based on these figures is not within the scope of a building code. The design and construction of tomorrow's buildings should not be based on the rough estimates of yesterday's energy distribution grid. Carbon emissions information is recognized as important information for an Owner to use in their construction decisions. However CO₂e is difficult as a minimum hurdle "enforcement tool" in code. CO₂e should be a reporting requirement for the baseline and design conditions and is all that is required. The reporting methodology is now made easier with the updated release of ASHRAE Standard 105 (Standard Methods of Determining, Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions). This ASHRAE standard can reference the latest eGRID via an ANSI standard methodology, yet leaves flexibility to the local jurisdiction to set multipliers the local authority might desire. The City of Tacoma, Washington, has its own electric utility that owns enough hydroelectric generation to provide over 80% of its power from this renewable source. They may wish to use a different multiplier for their CO₂e reporting.

Step 5: Path to net zero. Outside organizations can take the time to develop on their own a multiplier for the EUI of IECC/IgCC buildings to show the "path to zero". But setting an arbitrary multiplier in code as a minimum requirement for obtaining a certificate of occupancy should not be included in the IgCC.

Step 6: Table A106.1 for the electives for performance modeling beyond the Section 602 level is updated for a post-zEPI.

Cost Impact: Will not increase the cost of construction. The methodology will simplify methods of compliance for the construction community as well as for the enforcing jurisdictions.

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE105-2013 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GEW25-14: 601.3-HEIZER1122

GEW26-14

202, 302.1, 302.1.1, 602.1, 602.1.1, 602.1.2, 602.1.2.1, 602.1.2.2, 602.1.2.3, 602.2, 603.3.7, 1007.3, 1007.3.3.1, A106, A106.1

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org); Charles Foster, Steffes Corporation, representing self.

Delete and substitute definition as follows:

~~**ZERO ENERGY PERFORMANCE INDEX (zEPI).** A scalar representing the ratio of energy performance of the proposed design compared to the average energy performance of buildings relative to a benchmark year.~~

YEARLY ENERGY COST INDEX (yECI). A scalar representing the ratio of the annual energy cost of the proposed design compared to the annual energy cost of the same building constructed in accordance with the minimum requirements and maximum allowances of the *International Energy Conservation Code*.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a ~~zEPI of 46~~ yECI of 0.75 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
302.1, 302.1.1, 602.1	zEPI <u>yECI</u> of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 <u>yECI of 0.75</u> or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: _____ <u>yEPI</u> <u>yECI</u> : _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post Certificate of Occupancy zEPI <u>yECI</u> , energy demand, and CO ₂ e emissions reporting	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(portions of table not shown remain unchanged)

302.1.1 zEPI of 46 or less yECI of 0.75 or less. Where a zEPI of 46 yECI of 0.75 or less is indicated by the jurisdiction in Table 302.1, buildings shall comply on a performance-basis in accordance with Section 601.3.1.

Exception: Buildings less than 25,000 square feet (2323 m²) in *total building floor area* pursuing compliance on a prescriptive basis shall be deemed to have a zEPI of 54 yECI of 0.8 and shall not be required to comply with the zEPI yECI of Jurisdictional Choice indicated by the jurisdiction in Table 302.1.

Revise as follows:

602.1 Performance-based compliance. Compliance for buildings and their sites to be designed on a performance basis shall be determined by predictive modeling. Predictive modeling shall use ~~source energy cost kBtu/sf-y unit measure~~ based on compliance with Section 602.1.1 and CO₂e emissions in Section 602.3. Where a building has mixed uses, all uses shall be included in the performance-based compliance.

602.1.1 zEPI. yECI. Performance-based designs shall demonstrate ~~a~~ an annual energy cost index zEPI yECI of not more than ~~54~~ 0.8 as determined in accordance with Equation 6-1 for energy ~~use cost~~ reduction and shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.

$$zEPI = 57 \times (EUI_p/EUI) \quad yECI = (EUCI_p/EUCI) \quad \text{Equation 6-1)}$$

where:

EUI_p $EUCI_p$ = the proposed annual energy use index in source kBtu/sf-y cost for the proposed design of the building and its site calculated in accordance with Section 602.1.2.
 EUI $EUCI$ = the base annual energy use index in source kBtu/sf-y cost for a baseline building and its site calculated in accordance with Section 602.1.2.

602.1.2 Base Annual energy cost index. The proposed and base annual energy use cost index (EUI_p ECI_p and ECI) of the building and building site shall be calculated by a registered design professional in accordance with Equation 6-1 and an annual energy cost simulation software approved by the authority having jurisdiction and ~~Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through 602.1.2.3.~~ The annual energy use shall include all energy used for building functions and its anticipated occupancy.

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. ~~The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.~~

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97
AKMS	ASCC Miscellaneous	4.76
ERCT	ERCOT All	2.93
FRCC	FRCC All	2.97
HIMS	HICC Miscellaneous	3.82

eGRID-2007 SUB-REGION ACRONYM	eGRID-2007 SUB- REGION NAME	ENERGY CONVERSIO N FACTOR
HIOA	HICC-Oahu	3.14
MORE	MRO-East	3.40
MROW	MRO-West	3.41
NYLI	NPGC-Long-Island	3.20
NEWE	NPCC-New-England	3.01
NYCW	NPGC-NYC/Westchester	3.32
NYUP	NPCC-Upstate-NY	2.51
RFCE	RFC-East	3.15
RFCM	RFC-Michigan	3.05
RFCW	RFC-West	3.14
SRMW	SERC-Midwest	3.24
SRMV	SERC-Mississippi-Valley	3.00
SRSO	SERC-South	3.08
SRTV	SERC-Tennessee-Valley	3.11
SRVC	SERC-Virginia/Carolina	3.13
SPNO	SPP-North	3.53
SPSO	SPP-South	3.05
GAMX	WECC-California	2.61
NWPP	WECC-Northwest	2.26
RMPA	WECC-Rockies	3.18
AZNM	WECC-Southwest	2.95

a. Sources: EPA eGrid2007 version 1.1, 2005 data; EPA eGrid regional gross-grid loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.1.2.2 Electric power. In calculating the annual energy use index, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

**TABLE 602.1.2.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE^a**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas	1.09
Fuel Oil	1.13
LPG	1.12

a. Source: Gas Technology Institute Source Energy and Emissions Analysis Tool.

602.1.2.3 Nonrenewable energy. In calculating the annual energy use index for fuel other than electrical power, energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2. The conversion factor for energy sources not included in Table 602.1.2.2 shall be 1.1. Conversion factors for purchased district heating shall be 1.35 for hot water and 1.45 for steam. The conversion factor for district cooling shall be 0.33 times the value in Table 602.1.2.1 based on the EPA eGRID Sub-region in which the building is located.

602.2 Annual direct and indirect CO₂e emissions. The CO₂e emissions calculations for the building and building site shall be determined in accordance with Sections 602.2.1 and 602.2.2. The emissions associated with the proposed design shall be less than or equal to the CO₂e emissions associated with the standard reference design in accordance with Equation 6-2.

$$CO_2e_{pd} \geq (zEPI_{yECI} \times CO_2e_{srbd})/57 \quad \text{(Equation 6-2)}$$

where:

$zEPI_{yECI}$ = the minimum score calculated energy cost ratio in accordance with Section 602.1.1.

CO_2e_{pd} = emissions associated with the proposed design.

CO_2e_{srbd} = emissions associated with the standard reference budget design in accordance with Section 602.1.2.

603.3.7 Renewable and waste energy. Equipment and systems providing energy from renewable or waste energy sources which is included in the determination of the building $zEPI_{yECI}$, shall be capable of being metered to allow a determination of the output of equipment and systems in accordance with Sections 603.3.7.1 through 603.3.7.5.

Revise as follows:

1007.3 Post certificate of occupancy $zEPI_{yECI}$, energy demand, and CO₂e emissions reporting.

Where the jurisdiction indicates in Table 302.1 that ongoing post certificate of occupancy $yECI_{zEPI}$, energy demand and CO₂e emissions reporting is required, and where the jurisdiction has indicated in Table 302.1 that enhanced energy performance in accordance with Section 302.1 or CO₂e emissions in accordance with Section 602.2 are required, $yECI_{zEPI}$, energy demand, and CO₂e emissions reporting shall be provided in accordance with this section.

1007.3.3.1 Annual net energy use. The $zEPI_{yECI}$ associated with the operation of the building and the buildings on the site, as determined in accordance with Section 602.1, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its $zEPI_{yECI}$ reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the $zEPI_{yECI}$ for the building site shall be reported separately.

Energy use for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.

Revise as follows:

**TABLE A106
ENERGY CONSERVATION AND EFFICIENCY**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 10 to establish the minimum total number of project electives that must be satisfied.	—
A106.1	zEPI <u>yECI</u> reduction project electives	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	Project zEPI <u>yECI</u> is at least 5 points <u>3 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 1 elective
A106.1	Project zEPI <u>yECI</u> is at least 40 points <u>6 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 2 electives
A106.1	Project zEPI <u>yECI</u> is at least 45 points <u>9 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 3 electives
A106.1	Project zEPI <u>yECI</u> is at least 20 points <u>12 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 4 electives
A106.1	Project zEPI <u>yECI</u> is at least 25 points <u>15 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 5 electives
A106.1	Project zEPI <u>yECI</u> is at least 30 points <u>18 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 6 electives
A106.1	Project zEPI <u>yECI</u> is at least 35 points <u>21 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 7 electives
A106.1	Project zEPI <u>yECI</u> is at least 40 points <u>24 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 8 electives
A106.1	Project zEPI <u>yECI</u> is at least 45 points <u>27 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 9 electives
A106.1	Project zEPI <u>yECI</u> is at least 51 points <u>30 percent</u> lower than required by Table 302.1	<input type="checkbox"/> 10 electives
A106.2	Mechanical systems project elective	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.3	Service water heating	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.4	Lighting systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.5	Passive design	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—5 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—10 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems—20 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No

A106.1 ~~zEPI~~ yECI reduction project electives. Project electives for buildings pursuing performance-based compliance in accordance with Section 601.3.1 shall be in accordance with the portions of Table A106 that reference Section A106.1~~7~~, and Equation 6-1 ~~and the calculation procedures specified in Section 602.1.2.1.~~

Reason: This purpose of the proposal is to replace the existing zEPI concept with a new IgCC compliance metric; namely, yearly energy cost.

Conceptually, yECI is very straight forward as it merely compares the modeled energy cost of a proposed building to the modeled energy cost for the same building that is built to meet the minimum energy requirements of the IECC. yECI is flexible as it allows the use of any cost estimation software models so long as it has been approved by the authority having jurisdiction.

Energy cost is a metric that is easily understood by consumers, is used in several consensus building energy efficiency standards, and its adoption by the ICC would enhance the code's stature among the consuming public.

Moreover, there are many technical problems with how the existing zEPI metric is calculated. It is linked to ASHRAE Appendix G, and then modified with other factors. Under the latest revision to ASHRAE Standard 90.1 (2013), Appendix G and Chapter 11 (the Energy Cost Budget chapter) have been significantly changed. The key change is that the "baseline" building used for comparison is now "locked" using values and tables from ASHRAE 90.1-2004 (about equivalent to IECC 2006 Commercial Chapters). So while zEPI was originally intended to be compared to a building based on ASHRAE 90.1-2010, the ratio of 51/57 will now be used with a 2004 building, not a 2013 building.

Further, the existing zEPI approach uses so called "source energy" as its basis of comparison. To the extent source energy would ever be helpful (an assumption that is highly debated), the "source energy" estimates used for zEPI are out of date

and not technically defensible. The use of these incorrect and outdated estimates will lead to decisions that would increase energy usage and environmental impacts (e.g., switching end uses from electricity to fuel oil).

A 2012 DOE final report on focus group findings (for a program using source energy estimates) is helpful in understanding some of source energy's shortfalls. (See the Report at http://apps1.eere.energy.gov/buildings/publications/pdfs/commercial_initiative/asset_rating_seattle_focus_groups.pdf)

One of the Report's key findings was "[i]ncluding site versus source energy use was confusing or did not provide value. Site information was preferred by most stakeholders."

In addition, the report also stated "[s]everal building stakeholders did not find the source energy use information helpful because they are more concerned with site energy."

To meet the needs of building owners, the yearly energy cost index (yECI) would be most useful to users of the IgCC as shown in the DOE 2012 report:

Recommendation 5: Revise the cost metric data to enhance relevance to property owners and investors and increase overall understanding.

Property owners and investors were more interested in actual costs—for example, regional costs for energy use, estimated costs for energy consumption, and estimated costs/savings for upgrades for each system. Include estimated cost information, where possible, to address the needs of owners and investors.

Consistent with the DOE Report, by changing to a Yearly Energy Cost Index approach, the baseline building would be either the latest version of the IECC or ASHRAE 90.1 that is being enforced in a jurisdiction. In addition, it is a ratio that will have the most meaning to building owners that are trying to justify the extra expenses of building a green building.

Finally, rather than a 10.5% reduction as would occur using the zEPI approach (51/57 ratio), the requirements under the Yearly Energy Cost Index are 20% (0.8 ratio), which is significantly more stringent than the 10.5% reduction under zEPI.

In terms of specific proposed changes, this proposal would:

1. add a new definition for yECI
2. modify Section 3 by replacing zEPI with yECI,
3. modify Section 6 by replacing zEPI with yECI,
4. modify Section 10 by replacing zEPI with yECI, and
5. modify Appendix A by replacing zEPI with yECI.

Bibliography and web site links:

DOE, 2012. *DOE Commercial Building Energy Asset Rating Program Focus Groups with Primary Stakeholders in Seattle*. U.S. Department of Energy, Washington, D.C.

http://apps1.eere.energy.gov/buildings/publications/pdfs/commercial_initiative/asset_rating_seattle_focus_groups.pdf

<http://www.netl.doe.gov/energy-analyses/pubs/NG-GHG-LCI.pdf>

<http://www.pnas.org/content/early/2011/10/13/1107409108.full.pdf>

http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/2_6_Fugitive_Emissions_from_Oil_and_Natural_Gas.pdf

https://circabc.europa.eu/d/d/workspace/SpacesStore/db806977-6418-44db-a-64-20267139b34d/Brandt_Oil_Sands_GHGs_Final.pdf <http://www.nytimes.com/2011/09/27/business/energy-environment/in-north-dakota-wasted-natural-gas-flickers-against-the-sky.html?pagewanted=all>
<http://www.investmentu.com/2011/September/natural-gas-flaring.html>

Methane Leaks from North American Natural Gas Systems

Science 14 February 2014: DOI: 10.1126/science.1247045

<http://www.sciencemag.org/content/343/6172/733.summary?rss=1>

Cost Impact: Will not increase the cost of construction.

GEW26-14: 602.1-ROSENSTOCK497

GEW27-14

202, 302.1, Table 302.1, 302.1.1, 602, 602.1, 602.1.1, 602.1.2, 602.1.2.1, 602.1.2.2, 602.1.2.3, 602.2, 1007.3, 1007.3.3.1, A106.1

Proponent: Keith Dennis, NRECA, representing National Rural Electric Cooperative Association (keith.dennis@nreca.coop)

Add new definition as follows:

YEARLY ENERGY COST INDEX (yECI). A scalar representing the ratio of annual energy cost of the proposed design compared to the average annual energy cost of that same building constructed to meet the minimum energy requirements of the *International Energy Conservation Code*.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting “Yes” or “No” in Table 302.1. Where “Yes” is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or a yECI of 0.8 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where “Yes” or “No” boxes are provided, the jurisdiction shall check the box to indicate “Yes” where that section is to be enforced as a mandatory requirement in the jurisdiction, or “No” where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
302.1, 302.1.1, 602.1	zEPI <u>or yECI</u> of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 <u>or a yECI of .75</u> or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: _____ zEPI: _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No
CHAPTER 10. EXISTING BUILDINGS			
1007.2	Evaluation of existing buildings	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1007.3	Post Certificate of Occupancy zEPI <u>or yECI</u> , energy demand, and CO ₂ e emissions reporting	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged)

302.1.1 zEPI of 46 or yECI of 0.75 or less. Where a zEPI of 46 or a yECI of 0.75 or less is indicated by the jurisdiction in Table 302.1, buildings shall comply on a performance-basis in accordance with Section 601.3.1.

Exception: Buildings less than 25,000 square feet (2323 m²) in *total building floor area* pursuing compliance on a prescriptive basis shall be deemed to have a zEPI of 51 and shall not be required to comply with the zEPI of Jurisdictional Choice indicated by the jurisdiction in Table 302.1.

602 MODELED PERFORMANCE PATHWAY REQUIREMENTS

602.1 Performance-based compliance. Compliance for buildings and their sites to be designed on a performance basis shall be determined by predictive modeling. Predictive modeling shall use source energy kBtu/sf-y unit measure based on compliance with Section 602.1.1 and CO₂e emissions in Section 602.3. Where a building has mixed uses, all uses shall be included in the performance-based compliance.

602.1.1 zEPI and yECI. Performance-based designs shall demonstrate either:

1. A zEPI of not more than 51 as determined in accordance with Equation 6-1 or
2. A yECI of not more than 0.8 as determined in accordance with Equation 6-XXX, and
3. ~~for energy use reduction and~~ Shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.

$$zEPI = 57 \times (EUI_p/EUI) \quad \text{(Equation 6-1)}$$

$$yEPI = CIP / CI \quad \text{(Equation 6- XXX)}$$

where:

EUI_p = the proposed energy use index in source kBtu/sf-y for the proposed design of the building and its site calculated in accordance with Section 602.1.2.

EUI = the base annual energy use index in source kBtu/sf-y for a baseline building and its site calculated in accordance with Section 602.1.2.

CIP = the proposed annual energy cost for the proposed design of the building and its site calculated in accordance with Section 602.1.2.

CI = the proposed annual energy cost for a baseline building and its site calculated in accordance with Section 602.1.2.

602.1.2 Base annual energy use index. Where zEPI is being determined, the proposed energy use index (EUI_p) of the building and building site shall be calculated in accordance with Equation 6-1 and Appendix G to ASHRAE 90.1, as modified by Sections 602.1.2.1 through 602.1.2.3. The annual energy use shall include all energy used for building functions and its anticipated occupancy.

Where yECI is being determined, the proposed and base annual energy cost index (ECIP and ECI) of the building and building site shall be calculated by a registered design professional in accordance with Equation 6-XXX and annual energy cost simulation software approved by the authority having jurisdiction. The annual energy cost shall include all energy used for building functions and its anticipated occupancy.

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. Where zEPI is being determined, the performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.

602.1.2.2 Electric power. In calculating the annual energy use index for zEPI determinations, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

602.1.2.3 Nonrenewable energy. In calculating the annual energy use index for fuel other than electrical power, energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2. The conversion factor for energy sources not included in Table 602.1.2.2 shall be 1.1. Conversion factors for purchased district heating shall be 1.35 for hot water and 1.45 for steam. The conversion factor for district cooling shall be 0.33 times the value in Table 602.1.2.1 based on the EPA eGRID Sub-region in which the building is located.

602.2 Annual direct and indirect CO₂e emissions. The CO₂e emissions calculations for the building and building site shall be determined in accordance with Sections 602.2.1 and 602.2.2. The emissions associated with the proposed design shall be less than or equal to the CO₂e emissions associated with the standard reference design in accordance with Equation 6-2 or Equation 6-YY,)

For zEPI: CO₂e pd ≥ (zEPI × CO₂e srbd)/57 **(Equation 6-2)**

For yECI: CO₂e pd < CO₂e srbd x 0.8 **(Equation 6-YY)**

where:

zEPI = the minimum score in accordance with Section 602.1.1.

yECI = the minimum score in accordance with Section 602.1.1

CO₂e pd = emissions associated with the proposed design.

CO₂e srbd = emissions associated with the standard reference budget design in accordance with Section 602.1.2.

Revise as follows:

1007.3 Post certificate of occupancy zEPI, energy demand, and CO₂e emissions reporting. Where the jurisdiction indicates in Table 302.1 that ongoing post certificate of occupancy zEPI or yECI, energy demand and CO₂e emissions reporting is required, and where the jurisdiction has indicated in Table 302.1 that enhanced energy performance in accordance with Section 302.1 or CO₂e emissions in accordance with Section 602.2 are required, zEPI or yECI, energy demand, and CO₂e emissions reporting shall be provided in accordance with this section.

1007.3.3.1 Annual net energy use. The zEPI or yECI associated with the operation of the building and the buildings on the site, as determined in accordance with Section 602.1, shall be reported by the building owner or the owner's registered agent to the [INSERT NAME OF APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY RESPONSIBLE FOR COLLECTING REPORTED INFORMATION].

Where there are multiple buildings on a building site, each building shall have its zEPI reported separately. Where there are energy uses associated with the building site other than the buildings on the site, the zEPI for the building site shall be reported separately.

Energy use for the previous year shall cover the complete calendar year and be reported on, or before, March 1st of the following year.

Revise as follows:

A106.1 zEPI or yECI reduction project electives. Where zEPI is used, project electives for buildings pursuing performance-based compliance in accordance with Section 601.3.1 shall be in accordance with the portions of Table A106 that reference Section A106.1, Equation 6-1 or 6-2 and the calculation procedures specified in Section 602.1.2.1.

Reason: This proposal is part of a series of proposals that replaces the zero energy performance index (zEPI) with the Yearly Energy Cost Index.

There are many technical problems with how the the zEPI is calculated. It is linked to ASHRAE Appendix G, and then modified with other factors. Under the latest revision to ASHRAE 90.1 (2013), Appendix G and Chapter 11 (the

Energy Cost Budget chapter) have been significantly changed. The key change is that the "baseline" building used for comparison is now "locked" using values and tables from ASHRAE 90.1-2004 (about equivalent to IECC 2006 Commercial Chapters). So while the zEPI used to be compared to a building based on ASHRAE 90.1-2010, the ratio of 51/57 will now be used with a 2004 building, not a 2013 building.

By changing to the Yearly Energy Cost Index, the baseline building can be the latest version of the IECC or ASHRAE 90.1 that is being enforced in a jurisdiction. Energy cost is a metric that is understood by building owners, used in several consensus-based building energy efficiency standards such as ASHRAE 189.1 for green buildings, and its adoption by the ICC would enhance the code's stature among the consuming public.

In addition, it is a ratio that will have the most meaning to building owners that are trying to justify the extra expenses of building a green building. Also, rather than a 10.5% reduction (51/57 ratio), the requirements under the Yearly Energy Cost Index are 20% (0.8 ratio), which is significantly more stringent than the 10.5% reduction under zEPI.

Also, the "source energy" estimates are out of date and not technically defensible. The use of these incorrect and outdated estimates will lead to decisions that would increase energy usage and environmental impacts (e.g., switching end uses from electricity to fuel oil). As highlighted in the 2012 DOE final report on focus group findings (for a program using source energy estimates), which can be viewed at:

http://apps1.eere.energy.gov/buildings/publications/pdfs/commercial_initiative/asset_ratio_seattle_focus_groups.pdf

One of the key findings was: "Including site versus source energy use was confusing or did not provide value. Site information was preferred by most stakeholders." In addition, the report also stated: "Several building stakeholders did not find the source energy use information helpful because they are more concerned with site energy."

To meet the needs of building owners, the yearly energy cost index will be of the most use, as shown in the DOE 2012 report:

"Recommendation 5: Revise the cost metric data to enhance relevance to property owners and investors and increase overall understanding. Property owners and investors were more interested in actual costs—for example, regional costs for energy use, estimated costs for energy consumption, and estimated costs/savings for upgrades for each.

Cost Impact: Will not increase the cost of construction.

GEW27-14: 602.1-DENNIS1070

GEW28-14

602.1.2.1, Table 602.1.2.1, 602.1.2.2, Table 602.1.2.2, 602.1.2.3

Proponent: David Collins, The Preview Group, representing American Institute of Architects (dcollins@preview-group.com)

Revise as follows:

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. Energy units. The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost. Energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2.

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97
AKMS	ASCC Miscellaneous	4.76
ERCT	ERCOT All	2.93
FRCC	FRCC All	2.97
HIMS	HICC Miscellaneous	3.82
HIOA	HICC Oahu	3.14
MORE	MRO East	3.40
MROW	MRO West	3.41
NYLI	NPCC Long Island	3.20
NEWE	NPCC New England	3.04
NYCW	NPCC NYC/Westchester	3.32
NYUP	NPCC Upstate NY	2.51
RFCE	RFC East	3.15
RFCM	RFC Michigan	3.05
RFCW	RFC West	3.14
SRMW	SERC Midwest	3.24
SRMV	SERC Mississippi Valley	3.00
SRSO	SERC South	3.08
SRTV	SERC Tennessee Valley	3.11
SRVC	SERC Virginia/Carolina	3.13
SPNO	SPP North	3.53

eGRID-2007 SUB-REGION ACRONYM	eGRID-2007 SUB-REGION-NAME	ENERGY CONVERSION FACTOR
SPSO	SPP-South	3.05
CAMX	WECC-California	2.61
NWPP	WECC-Northwest	2.26
RMPA	WECC-Rockies	3.18
AZNM	WECC-Southwest	2.95

a. Sources: EPA eGrid2007 version 1.1, 2005 data; EPA eGrid regional gross grid loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.1.2.2 Site to source electric power conversion. In calculating the annual energy use index, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

**TABLE 602.1.2.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE^a**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas	1.09
Fuel Oil	1.13
LPG	1.12

a. Source: Gas Technology Institute Source Energy and Emissions Analysis Tool.

602.1.2.3 Nonrenewable energy. In calculating the annual energy use index for fuel other than electrical power, energy use shall be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2. The conversion factor for energy sources not included in Table 602.1.2.2 shall be 1.1. Conversion factors for purchased district heating shall be 1.35 for hot water and 1.45 for steam. The conversion factor for district cooling shall be 0.33 times the value in Table 602.1.2.1 based on the EPA eGRID Sub-region in which the building is located.

Reason: The three sections of 602.1.2 are unnecessarily complicated. Sections 602.1.2.1, 602.1.2.2 and 602.1.2.3 provide what is identified in their titles as modifications to Appendix G of ASHRAE 90.1, but in reality they are simply attempting to change the methods of looking at various energy sources so that they can be evaluated in a consistent manner. The change to Section 602.1.2.1 is therefore changed to match the content of the section. The content of the table has been modified to include all fuels addressed.

The title to Section 602.1.2.2 has been changed to make what is occurring in the section clear. Finally, Section 602.1.2.3 has been modified by deleting the provision as they will already addressed in the changes to 602.1.2.1 requiring energy to be measured consistently, independent of the type of energy.

Cost Impact: Will not increase the cost of construction.

GEW28-14: 602.1.2.1#1-COLLINS695

GEW29-14

602.1.2.1

Proponent: David Collins, The Preview Group, representing American Institute of Architects (dcollins@preview-group.com)

Revise as follows:

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use instead of cost. Energy use shall be converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost. by multiplying the nonrenewable energy fossil use at the utility meter or measured point of delivery to Btu's and multiplying by the conversion factor in Table 602.1.2.2.

Reason: In the performance modeling required by the IgCC and to determine an appropriate ZEPI value, this exception in the energy modeling protocol of ASHRAE 90.1 Appendix G disallows the inclusion of on-site or site recovered renewable energy sources.

The IgCC was originally intended to recognize and include the use of on-site or site recovered renewable energy sources in calculating the ZEPI value for a building intended to comply with the IgCC.

By eliminating this exception the energy modeling protocol of ASHRAE 90.1 is modified to meet the original intent of the SBTC in developing the IgCC and the ASHRAE 90.1 Appendix G modeling protocol is aligned with the original drafting intent of the code. For the edification of the reader the exception to G2.4 states:

G2.4.1 On-Site Renewable Energy and Site-Recovered Energy.

Site-Recovered energy shall not be considered purchased energy and shall be subtracted from the proposed design energy consumption prior to calculating the proposed building performance. On-site renewable energy generated by systems included on the building permit that is used by the building shall be subtracted from the proposed design energy consumption prior to calculating the proposed building performance.

Cost impact: Will not increase the cost of construction.

GEW29-14: 602.1.2.1 #2-COLLINS920

GEW30-14

602.1.2.1, Table 602.1.2.1, 602.1.2.2, Table 602.1.2.2, 602.2.1, Table 602.2.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97
AKMS	ASCC Miscellaneous	1.76
ERCT	ERCOT All	2.93
FRCC	FRCC All	2.97
HIMS	HICC Miscellaneous	3.82
HIOA	HICC Oahu	3.14
MORE	MRO East	3.40
MROW	MRO West	3.41
NYLI	NPCC Long Island	3.20
NEWE	NPCC New England	3.01
NYCW	NPCC NYC/Westchester	3.32
NYUP	NPCC Upstate NY	2.51
RFCE	RFC East	3.15
RFCM	RFC Michigan	3.05
RFCW	RFC West	3.14
SRMW	SERC Midwest	3.24
SRMV	SERC Mississippi Valley	3.00
SRSO	SERC South	3.08
SRTV	SERC Tennessee Valley	3.11
SRVC	SERC Virginia/Carolina	3.13
SPNO	SPP North	3.53
SPSO	SPP South	3.05
CAMX	WECC California	2.61

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
NWPP	WECC Northwest	2.26
RMPA	WECC Rockies	3.18
AZNM	WECC Southwest	2.95

a. Sources: EPA eGrid2007 version 1.1, 2005 data; EPA eGrid regional gross grid-loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.1.2.2 Electric power. In calculating the annual energy use index, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

**TABLE 602.1.2.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE^a**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas	1.09
Fuel Oil	1.13
LPG	1.12

a. Source: Gas Technology Institute Source Energy and Emissions Analysis Tool.

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWhs, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	1270
AKMS	ASCC Miscellaneous	515
ERCT	ERCOT All	1417
FRCC	FRCC All	1416
HIMS	HICC Miscellaneous	1595
HIOA	HICC Oahu	18591
MORE	MRO East	1971
MROW	MRO West	1957
NYLI	NPCC Long Island	1651
NEWE	NPCC New England	999
NYCW	NPCC NYC/Westchester	874
NYUP	NPCC Upstate NY	774

RFCE	RFC East	1224
RFCM	RFC Michigan	1680
RFCW	RFC West	1652
SRMW	SERC Midwest	1966
SRMV	SERC Mississippi Valley	1094
SRSO	SERC South	1601
SRTV	SERC Tennessee Valley	1623
SRVC	SERC Virginia/Carolina	1220
SPNO	SPP North	2106
SPSO	SPP South	1780
CAMX	WECC California	768
NWPP	WECC Northwest	958
RMPA	WECC Rockies	1999
AZNM	WECC Southwest	1391

a. Sources: EPA eGRID2007 Version 1.1, 2005 data; EPA eGrid regional gross grid loss factor.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The purpose of this proposal is to delete the footnotes from Tables 602.1.2.1, 602.1.2.2 and 602.2.1. The balance of the tables are to remain the same.

The footnote for each of the three tables is commentary information and should be located in the commentary and not in the code. The footnotes do not provide any information which adjusts the table values nor provide information how the values in the table are to be applied. Such background information was important as the IgCC was developed, but should have been removed before the code was finalized and published.

Cost Impact: Will not increase the cost of construction. The proposal is editorial and removes non-regulatory language.

GEW30-14: TABLE602.1.2.1-THOMPSON566

GEW31-14

602.1.2.1, Table 602.1.2.1, 602.1.2.2, Table 602.1.2.2, 602.2.1, Table 602.2.1, 602.2.2, Table 602.2.2

Proponent: Neil Leslie, Gas Technology Institute, representing self
(neil.leslie@gastechnology.org)

Revise as follows:

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97 <u>3.15</u>
AKMS	ASCC Miscellaneous	1.76 <u>1.90</u>
ERCT	ERCOT All	2.93 <u>3.08</u>
FRCC	FRCC All	2.97 <u>3.26</u>
HIMS	HICC Miscellaneous	3.82 <u>3.67</u>
HIOA	HICC Oahu	3.14
MORE	MRO East	3.40 <u>3.50</u>
MROW	MRO West	3.41 <u>3.64</u>
NYLI	NPCC Long Island	3.20 <u>3.47</u>
NEWE	NPCC New England	3.04 <u>3.03</u>
NYCW	NPCC NYC/Westchester	3.32 <u>3.21</u>
NYUP	NPCC Upstate NY	2.54 <u>2.66</u>
RFCE	RFC East	3.15 <u>3.28</u>
RFCM	RFC Michigan	3.05 <u>3.35</u>
RFCW	RFC West	3.14 <u>3.29</u>
SRMW	SERC Midwest	3.24 <u>3.40</u>
SRMV	SERC Mississippi Valley	3.00 <u>3.20</u>
SRSO	SERC South	3.08 <u>3.30</u>
SRTV	SERC Tennessee Valley	3.11 <u>3.24</u>
SRVC	SERC Virginia/Carolina	3.13 <u>3.24</u>
SPNO	SPP North	3.53 <u>3.57</u>
SPSO	SPP South	3.05 <u>3.26</u>

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
CAMX	WECC California	2.64 <u>2.89</u>
NWPP	WECC Northwest	2.26 <u>2.32</u>
RMPA	WECC Rockies	3.18 <u>3.82</u>
AZNM	WECC Southwest	2.95 <u>3.10</u>
<u>None</u>	Not Included	3.15

a. Sources: EPA eGrid 2007 version 1.1, 2005 data; EPA eGrid regional gross grid loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.1.2.2 Electric power. In calculating the annual energy use index, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

**TABLE 602.1.2.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE^a**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas	1.09
Fuel Oil	4.13 <u>1.19</u>
LPG	4.12 <u>1.15</u>

a. Source: Gas Technology Institute Source Energy and Emissions Analysis Tool.

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to kWh/MWhs, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	4270 <u>0.685</u>
AKMS	ASCC Miscellaneous	545 <u>0.265</u>
ERCT	ERCOT All	4417 <u>0.698</u>
FRCC	FRCC All	4416 <u>0.617</u>
HIMS	HICC Miscellaneous	4595 <u>0.722</u>
HIOA	HICC Oahu	48594 <u>0.825</u>
MORE	MRO East	4974 <u>0.909</u>
MROW	MRO West	4957 <u>0.964</u>
NYLI	NPCC Long Island	4654 <u>0.698</u>
NEWE	NPCC New England	999 <u>0.428</u>

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
NYCW	NPCC NYC/Westchester	874 <u>0.391</u>
NYUP	NPCC Upstate NY	774 <u>0.369</u>
RFCE	RFC East	1224 <u>0.543</u>
RFCM	RFC Michigan	1680 <u>0.874</u>
RFCW	RFC West	1652 <u>0.820</u>
SRMW	SERC Midwest	1966 <u>0.960</u>
SRMV	SERC Mississippi Valley	1094 <u>0.572</u>
SRSO	SERC South	1604 <u>0.780</u>
SRTV	SERC Tennessee Valley	1623 <u>0.818</u>
SRVC	SERC Virginia/Carolina	1220 <u>0.581</u>
SPNO	SPP North	2106 <u>0.972</u>
SPSO	SPP South	1780 <u>0.873</u>
CAMX	WECC California	768 <u>0.370</u>
NWPP	WECC Northwest	958 <u>0.453</u>
RMPA	WECC Rockies	1999 <u>1.149</u>
AZNM	WECC Southwest	1391 <u>0.671</u>
<u>None</u>	<u>Not Included</u>	<u>0.692</u>

a. Sources: EPA eGRID 2007 Version 1.1, 2005 data; EPA eGrid regional gross grid-loss factor.

602.2.2 Onsite nonrenewable energy. Emissions associated with the use of nonrenewable energy sources other than electrical power such as natural gas, fuel oil, and propane shall be calculated by multiplying the fossil fuel energy used by the building and its site at the utility meter by the national emission factors in Table 602.2.2 and the conversions required by this section. Emissions associated with fossil fuels not specified in Table 602.2.2 shall be calculated by multiplying the fossil fuel used by the building at the utility meter by ~~250~~ 217. Emissions associated with purchased district energy shall be calculated by multiplying the energy used by the building at the utility meter by ~~450~~ 191 for hot water, 205 for ~~and~~ steam, and 147 for district cooling, the factors from Table 602.2.2 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.2
FOSSIL FUEL EMISSION FACTORS**

EMISSION RATE (lb/MMBtu HHV)	NATURAL GAS AS STATIONARY FUEL	FUEL OIL AS STATIONARY FUEL	PROPANE AS STATIONARY FUEL
CO ₂ e	137.35 <u>141</u>	200.63 <u>198</u>	162.85 <u>172</u>

For SI: MMBtu = 1,000,000 Btu = 10 ~~terms~~ therms; HHV = High Higher-heating value.

Reason: This proposal updates factors for all energy forms based on the methodology and values contained in the revised version of ASHRAE Standard 105, Standard Methods of Determining, Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions, Tables J2-A through J2-D.

The proposal also adds a row of electricity conversion factors for those interested in using the code (such as Canada or Mexico) whose buildings are not located in any of the eGRID sub-regions.

The footnoted sources of the data in the tables should not be in the body of the code, but can be in the users manual.

The proposal also fixes typos in the footnote to Table 602.2.2.

Bibliography:

ASHRAE Standard 105, Standard Methods of Determining, Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions (publication expected in 2014).

Cost Impact: Will not increase the cost of construction.

GEW31-14: TABLE602.1.2.1-LESLIE1037

GEW32-14

602.1.2.1, Table 602.1.2.1, 602.2.1, Table 602.2.1

Proponent: Bridget Herring, Mathis Consulting Company, representing self

Revise as follows:

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB- REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97 <u>3.41</u>
AKMS	ASCC Miscellaneous	1.76 <u>3.27</u>
ERCT	ERCOT All	2.93 <u>2.89</u>
FRCC	FRCC All	2.97 <u>2.99</u>
HIMS	HICC Miscellaneous	3.82 <u>3.61</u>
HIOA	HICC Oahu	3.14 <u>3.53</u>
MORE <u>MROE</u>	MRO East	3.40 <u>3.21</u>
MROW	MRO West	3.41 <u>3.63</u>
NYLI	NPCC Long Island	3.20 <u>3.57</u>
NEWE	NPCC New England	3.04 <u>2.80</u>
NYCW	NPCC NYC/Westchester	3.32 <u>3.10</u>
NYUP	NPCC Upstate NY	2.54 <u>2.82</u>
RFCE	RFC East	3.15 <u>3.11</u>
RFCM	RFC Michigan	3.05 <u>3.18</u>
RFCW	RFC West	3.14 <u>3.26</u>
SRMW	SERC Midwest	3.24 <u>3.46</u>
SRMV	SERC Mississippi Valley	3.00 <u>3.15</u>
SRSO	SERC South	3.08 <u>3.05</u>
SRTV	SERC Tennessee Valley	3.14 <u>3.23</u>
SRVC	SERC Virginia/Carolina	3.13 <u>3.14</u>
SPNO	SPP North	3.53 <u>3.69</u>
SPSO	SPP South	3.05 <u>3.31</u>
CAMX	WECC California	2.64 <u>2.99</u>

NWPP	WECC Northwest	2.26 3.05
RMPA	WECC Rockies	3.18 3.41
AZNM	WECC Southwest	2.95 2.89

a. Sources: EPA eGrid2007 version 1.1, 2005 data; EPA eGrid regional gross grid loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWh, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	4270 1647
AKMS	ASCC Miscellaneous	515 1826
ERCT	ERCOT All	4417 1449
FRCC	FRCC All	4416 1579
HIMS	HICC Miscellaneous	4595 2046
HIOA	HICC Oahu	18594 2046
MORE MROE	MRO East	4974 2135
MROW	MRO West	4957 2432
NYLI	NPCC Long Island	4654 1678
NEWE	NPCC New England	999 1402
NYCW	NPCC NYC/Westchester	874 1408
NYUP	NPCC Upstate NY	774 1584
RFCE	RFC East	4224 1874
RFCM	RFC Michigan	4680 2084
RFCW	RFC West	4652 2463
SRMW	SERC Midwest	4966 2463
SRMV	SERC Mississippi Valley	4094 1504
SRSO	SERC South	4604 1864
SRTV	SERC Tennessee Valley	4623 2160
SRVC	SERC Virginia/Carolina	4220 1923
SPNO	SPP North	2406 2451
SPSO	SPP South	4780 1818
CAMX	WECC California	768 1294

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
NWPP	WECC Northwest	958 <u>1698</u>
RMPA	WECC Rockies	1999 <u>2088</u>
AZNM	WECC Southwest	1394 <u>1473</u>

a. Sources: EPA eGRID2007 Version 1.1, 2005 data; EPA eGrid regional gross grid loss factor.

Reason: Changes in electricity consumption (such as those attributable to a new building complying with IgCC) are not distributed uniformly within or across the grid. For this reason, it is important to distinguish between electricity conversion factors for inventory purposes and conversion factors for investment purposes. Although average primary energy and emissions calculations may be suitable for inventory and benchmarking purposes, they do not necessarily provide accurate information when making competitive energy efficiency design or investment decisions. The regional average factors in the 2012 IgCC do not reflect the impact of these decisions on incremental primary energy consumption or pollutant emissions and can be even more misleading than national average factors in many situations. This is especially true for regions that have large fractions of hydropower or nuclear power. Marginal calculation methodologies are more accurate than either national or regional average calculations for evaluating the impacts of changes in electricity consumption, such as comparing new building energy efficiency design options or evaluating competing retrofit measures.

Keith and Biewald developed a methodology implemented by the EPA for calculating marginal (or non-baseload) power plant emission rates based on the capacity factor of each plant. EPA implemented this methodology in the eGRID database to list the emissions of "non-baseload" power plants for application in marginal generation scenarios and analyses. The Keith and Biewald non-baseload methodology was used in development of the primary energy and CO₂e emission factors for each eGRID sub-region in this proposal. The attached document and conference paper in the bibliography each provide additional details on the use of marginal methodologies including the Keith and Biewald non-baseload methodology.

Bibliography:

EPA eGRID original data:

<http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>

Leslie, N. and Marek Czachorski. 2014. Options for Determining Marginal Primary Energy and Greenhouse Gas Emission Factors (NY-14-C057). ASHRAE Transactions, Vol. 120, pt.

1. Atlanta: American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc.

Cost Impact: Will not increase the cost of construction.

GEW32-14: TABLE602.1.2.1-HERRING1014

GEW33-14

602.1.2.1, Table 602.1.2.1, 602.2.1, Table 602.2.1

Proponent: Ben Edwards, Mathis Consulting Company, representing self

Revise as follows:

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97 <u>3.27</u>
AKMS	ASCC Miscellaneous	1.76 <u>1.93</u>
ERCT	ERCOT All	2.93 <u>3.11</u>
FRCC	FRCC All	2.97 <u>3.17</u>
HIMS	HICC Miscellaneous	3.82 <u>3.78</u>
HIOA	HICC Oahu	3.14 <u>3.29</u>
MORE	MRO East	3.40 <u>3.28</u>
MROW	MRO West	3.41 <u>3.49</u>
NYLI	NPCC Long Island	3.20 <u>3.41</u>
NEWE	NPCC New England	3.04 <u>2.94</u>
NYCW	NPCC NYC/Westchester	3.32 <u>3.09</u>
NYUP	NPCC Upstate NY	2.54 <u>2.55</u>
RFCE	RFC East	3.15 <u>3.23</u>
RFCM	RFC Michigan	3.05 <u>3.29</u>
RFCW	RFC West	3.14 <u>3.27</u>
SRMW	SERC Midwest	3.24 <u>3.33</u>
SRMV	SERC Mississippi Valley	3.00 <u>3.13</u>
SRSO	SERC South	3.08 <u>3.06</u>
SRTV	SERC Tennessee Valley	3.14 <u>3.10</u>
SRVC	SERC Virginia/Carolina	3.13 <u>3.23</u>
SPNO	SPP North	3.53 <u>3.58</u>
SPSO	SPP South	3.05 <u>3.22</u>
CAMX	WECC California	2.64 <u>2.93</u>

NWPP	WECC Northwest	2.26 <u>2.36</u>
RMPA	WECC Rockies	3.18 <u>3.48</u>
AZNM	WECC Southwest	2.95 <u>3.18</u>

a. Sources: EPA eGrid2007 version 1.1, 2005 data; EPA eGrid regional gross grid loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWhs, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	1270 <u>1577</u>
AKMS	ASCC Miscellaneous	515 <u>639</u>
ERCT	ERCOT All	1417 <u>1445</u>
FRCC	FRCC All	1416 <u>1322</u>
HIMS	HICC Miscellaneous	1595 <u>1566</u>
HIOA	HICC Oahu	18594 <u>1873</u>
MORE <u>MROE</u>	MRO East	1971 <u>1813</u>
MROW	MRO West	1957 <u>1851</u>
NYLI	NPCC Long Island	1651 <u>1447</u>
NEWE	NPCC New England	999 <u>813</u>
NYCW	NPCC NYC/Westchester	874 <u>768</u>
NYUP	NPCC Upstate NY	774 <u>590</u>
RFCE	RFC East	1224 <u>1065</u>
RFCM	RFC Michigan	1680 <u>1874</u>
RFCW	RFC West	1652 <u>1711</u>
SRMW	SERC Midwest	1966 <u>1976</u>
SRMV	SERC Mississippi Valley	1094 <u>1221</u>
SRSO	SERC South	1601 <u>1519</u>
SRTV	SERC Tennessee Valley	1623 <u>1538</u>
SRVC	SERC Virginia/Carolina	1220 <u>1180</u>
SPNO	SPP North	2106 <u>2062</u>
SPSO	SPP South	1780 <u>1860</u>
CAMX	WECC California	768 <u>835</u>

NWPP	WECC Northwest	958 <u>959</u>
RMPA	WECC Rockies	1999 <u>2131</u>
AZNM	WECC Southwest	1391 <u>1428</u>

a. Sources: EPA eGRID2007 Version 1.1, 2005 data; EPA eGrid regional gross grid loss factor.

Reason: Updated factors based on the eGRID 2012 database (the most current eGRID data available) as described in detail in the peer-reviewed ASHRAE conference paper listed in the bibliography.

Bibliography:

EPA eGRID original data: <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>

Leslie, N. and Marek Czachorski. 2014. Options for Determining Marginal Primary Energy and Greenhouse Gas Emission Factors (NY-14-C057). ASHRAE Transactions, Vol. 120, pt. 1. Atlanta: American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc..

Cost Impact: Will not increase the cost of construction.

GEW33-14: TABLE602.1.2.1-EDWARDS996

GEW34-14

Table 602.2.1, 602.2.3, 603.5.1

Proponent: Charles Foster, Steffes Corporation, representing self (cfoster20187@yahoo.com)

Revise as follows:

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWhs, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

eGRID 2007 <u>2012</u> SUB-REGION ACRONYM	eGRID 2007 <u>2012</u> SUB- REGION NAME	2005 <u>2009</u> CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	4270 <u>1281</u>
AKMS	ASCC Miscellaneous	545 <u>521</u>
ERCT	ERCOT All	4447 <u>1182</u>
FRCC	FRCC All	4446 <u>1177</u>
HIMS	HICC Miscellaneous	4595 <u>1352</u>
HIOA	HICC Oahu	48594 <u>1593</u>
MORE <u>MROE</u>	MRO East	4974 <u>1592</u>
MROW	MRO West	4957 <u>1629</u>
NYLI	NPCC Long Island	4654 <u>0</u>
NEWE	NPCC New England	999 <u>0</u>
NYCW	NPCC NYC/Westchester	874 <u>0</u>
NYUP	NPCC Upstate NY	774 <u>0</u>
RFCE (<u>except</u> <u>MD and DE</u>)	RFC East	4224 <u>947</u>
RFCM	RFC Michigan	4680 <u>1659</u>
RFCW (<u>except</u> <u>MD</u>)	RFC West	4652 <u>1521</u>
SRMW	SERC Midwest	4966 <u>1750</u>
SRMV	SERC Mississippi Valley	4094 <u>1022</u>
SRSO	SERC South	4604 <u>1326</u>
SRTV	SERC Tennessee Valley	4623 <u>1358</u>
SRVC	SERC Virginia/Carolina	4220 <u>1036</u>
SPNO	SPP North	2406 <u>1816</u>
SPSO	SPP South	4780 <u>1599</u>

eGRID 2007 2012 SUB-REGION ACRONYM	eGRID 2007 2012 SUB-REGION NAME	2005 2009 CO ₂ e RATE (lbs/MWh)
CAMX	WECC California	768 0
NWPP (except CA)	WECC Northwest	958 819
RMPA	WECC Rockies	1999 1825
AZNM (except CA)	WECC Southwest	1394 1191

a. Sources: EPA eGRID2007 2012 Version 4.4 1.0, 2005 2009 data; EPA eGrid regional gross grid loss factor.

602.2.3 Annual direct and indirect CO₂e emissions associated with onsite use of fossil fuels and purchased district energy. Emissions associated with the use of natural gas, fuel oil and, propane shall be calculated by multiplying the natural gas, fuel oil, and propane delivered to the building at the utility meter by the corresponding emission factors in Table 602.2.2. Emissions associated with fossil fuels not listed shall be calculated by multiplying the fossil fuel delivered to the building at the utility meter by 250. Emissions associated with purchased district heating shall be calculated by multiplying the heating energy delivered to the building at the utility meter by 150 for hot water and steam, and for district cooling, the factors from Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

603.5.1 Annual emissions. The data acquisition and management system shall be capable of providing the data necessary to calculate the annual CO₂e emissions associated with the operation of the building and its systems using the results of annual energy use measured in accordance with Section 603.5. The calculation shall be based on energy measured for each form of energy delivered to the site on an annual basis. Where reporting of emissions is required, the determination of emissions shall be in accordance with Section 602.2.2 602.2.3.

Reason: This proposal does two primary things:

1. it updates Table 602.2.1 with data from 2009, replacing the existing data in the table from 2005, and
2. it deletes Section 602.2.3 as duplicative with Section 602.2.2.

Updated Data.

Table 602.2.1 is updated with more current data taken from EPA's EGrid2012 publication, except for subregions where CO₂ emissions are capped. In subregions where CO₂ emissions are capped, a value of "0" is supplied.

Where upstream power plant emissions are capped by local, regional, or national laws, there is no impact on emissions as a result of building energy efficiency measures. The US Department of Energy has analyzed the impact of appliance efficiency standards on emissions, and for the past several years, uses the following language when discussing certain emissions that are capped. For example, in the Furnace Fan Motors Technical Support Document, June 2012 <http://www.regulations.gov/#!documentDetail;D=EERE-2010-BT-STD-0011-0037> it states for Sulfur Dioxide (Chapter 15.2.2), which is capped on a national basis in the United States:

"While there remains some uncertainty about the ultimate effects of efficiency standards on SO₂ emissions covered by the existing cap and trade system, the NEMS-BT modeling system that DOE uses to forecast emissions reductions currently indicates that no physical reductions in power sector emissions would occur for SO₂."

It also states for Nitrogen Oxides (Chapter 15.2.3), which is capped on a regional basis in the United States: "Therefore, energy conservation standards for electric motors may have little or no physical effect on these emissions in the 28 eastern states and the D.C."

In the US in 2013, there are two regional programs that cap CO₂e emissions from central station power plants: The Regional Greenhouse Gas Initiative (RGGI) that covers 9 states in the New England and mid-Atlantic area (CT, DE, MA, MD, ME, NH, NY, RI, VT) and the California greenhouse gas cap and trade program mandated under state law AB32 and implemented by the California Air Resources Board. In these areas, building energy efficiency improvements have no impact on upstream emissions.

Under the RGGI and CA programs, power plant CO₂e emissions are capped. Building energy efficiency upgrades will have no impact on upstream emissions (per the DOE analysis of appliance energy efficiency standards for emissions that are capped at a national or regional level). See the following web sites:

<http://www.regulations.gov/#!documentDetail;D=EERE-2010-BT-STD-0011-0037> (Chapter 15)

<http://www.rggi.org/design/overview> <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

It is also a fact that when renewable electric production systems produce electricity, the power is dispatched to the grid, regardless of the time of day. In certain parts of the US, records have been set in terms of renewables as a percentage of the electricity dispatched.

For example: ERCOT Wind Integration Report for 11/10/2012, wind turbines produced 8,521 MW when the peak load was 36,423 MW, for a wind integration value of 25.9%. During the peak hour of 1900 (7:00 PM), wind turbines produced 22.7% of the power that was used at that time.

On November 27, 2012 the Midwest Independent System Operator reported that on November 23, 2012, the peak wind output topped 10 GW and it represented 25% of the total output.

Xcel Energy in Colorado reported that on April 15, 2012, wind turbines produced 57% of the power used during the early morning hours.

<http://money.cnn.com/2012/08/06/news/economy/wind-power-Colorado/index.htm>

<https://www.midwestiso.org/AboutUs/MediaCenter/PressReleases/Pages/WindOutputSurpasses10GW.aspx>

<http://www.ercot.com/content/gridinfo/generation/windintegration/2012/11/ERCOT%20Wind%20Integration%20Report%2011-10-12.pdf>

Delete Section 602.2.3

Sections 602.2.2 and 602.2.3 are virtually identical and this proposal simply strikes the repetitive language. No substantive change to the code occurs as the result of removing Section 602.2.3.

Cost Impact: Will not increase the cost of construction.

GEW34-14: 602.2.3-FOSTER512

GEW35-14

602.2.1, Table 602.2.1

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWhs, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

eGRID-2007-SUB-REGION ACRONYM	eGRID-2007-SUB-REGION NAME	2005 CO ₂ e RATE AFTER 2015 (lbs/MWh)
AKGD	ASCC-Alaska-Grid All regions of the US	1270 0.0
AKMS	ASCC-Miscellaneous	515
ERCT	ERCOT-All	1417
FRCC	FRCC-All	1416
HIMS	HICC-Miscellaneous	1595
HIOA	HICC-Oahu	18594
MORE	MRO-East	1971
MROW	MRO-West	1957
NYLI	NPCC-Long-Island	1651
NEWE	NPCC-New-England	999
NYCW	NPCC-NYC/Westchester	874
NYUP	NPCC-Upstate-NY	774
RFGE	RFC-East	1224
RFCM	RFC-Michigan	1680
RFCW	RFC-West	1652
SRMW	SERC-Midwest	1966
SRMV	SERC-Mississippi-Valley	1094
SRSO	SERC-South	1601
SRTV	SERC-Tennessee-Valley	1623
SRVC	SERC-Virginia/Carolina	1220
SPNO	SPP-North	2406

eGRID-2007-SUB-REGION ACRONYM	eGRID-2007-SUB-REGION NAME	2005 CO ₂ e RATE AFTER 2015 (lbs/MWh)
SPSQ	SPP-South	1780
CAMX	WECC-California	768
NWPP	WECC-Northwest	958
RMPA	WECC-Rockies	1999
AZNM	WECC-Southwest	1391

a. Sources: EPA eGRID2007 Version 1.1, 2005 data; EPA eGrid regional gross grid loss factor.

Reason: Table 602.2.1 has values that are significantly out of date (2005) and do not reflect the realities of indirect emissions from electricity production that will occur as a result of federal policies.

In terms of the numbers, the US Energy Information Administration has published the Electric Power Annual 2012, which can be accessed at the following web site: <http://www.eia.gov/electricity/annual/>. Table 9.1 of this document shows that between 2005 and 2012, the electric power sector has:

- -Reduced its emissions of CO₂ by 15.2%.
- -Reduced its emissions of SO₂ by 64.2%
- -Reduced its emissions of NO_x by 45.8%

This occurred at the same time that overall net generation was down very slightly (-0.2% from 2005 to 2012). Therefore, the values shown in the table are overstated by at least 15% on a national level, and even more in certain sub-regions of the United States.

In addition, the table does not account for the fact that power plant emissions are capped in CA and in all of the states that are part of the Regional Greenhouse Gas Initiative (RGGI) in the Northeastern part of the US.

Also, in September 2013, the US EPA published a rule that caps the emissions of greenhouse gases from all new fossil-fueled power plants that will be built in the United States. Information on this rule can be found at the following web site: <http://www2.epa.gov/carbon-pollution-standards/regulatory-actions>

EPA is also planning to regulate the emissions from all existing power plants in the United States. This rule is scheduled to be published by June 2014, to take effect in 2015 or 2016.

The impact of all of these regulations and programs is to "decouple" power plant emissions from building electricity use. Where upstream power plant emissions are capped by local, regional, or national laws, there is no impact on emissions as a result of building energy efficiency measures. The US Department of Energy analyzes the impact of appliance efficiency standards on emissions, and for the past several years, uses the following language when discussing the impact of appliance efficiency standards on certain emissions that are capped. For example, in the Furnace Fan Motors Technical Support Document, June 2012 <http://www.regulations.gov/#!documentDetail;D=EERE-2010-BT-STD-0011-0037> it states for Sulfur Dioxide (Chapter 15.2.2), which is capped on a national basis in the United States: "While there remains some uncertainty about the ultimate effects of efficiency standards on SO₂ emissions covered by the existing cap and trade system, the **NEMS-BT modeling system that DOE uses to forecast emissions reductions currently indicates that no physical reductions in power sector emissions would occur for SO₂**." (emphasis added)

It also states for Nitrogen Oxides (Chapter 15.2.3), which is capped on a regional basis in the United States: "Therefore, energy conservation standards for electric motors may have little or no physical effect on these emissions in the 28 eastern states and the D.C."

After EPA finalizes its rules on new and existing power plants, the same logic will apply to greenhouse gases, that any changes to building electric usage as a result of this standard will have no impact on upstream and indirect emissions from power plants.

Therefore, the current table should be removed and replaced with the suggested table.

Cost Impact: Will not increase the cost of construction.

GEW35-14: 602.2.1-ROSENSTOCK506

GEW36-14

602.2.1, Table 602.2.1

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Revise as follows:

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to MWhs, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a**

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB- REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	1270
AKMS	ASCC Miscellaneous	515
ERCT	ERCOT All	1417
FRCC	FRCC All	1416
HIMS	HICC Miscellaneous	1595
HIOA	HICC Oahu	18591 <u>1859</u>
MORE	MRO East	1971
MROW	MRO West	1957
NYLI	NPCC Long Island	1651
NEWE	NPCC New England	999
NYCW	NPCC NYC/Westchester	874
NYUP	NPCC Upstate NY	774
RFCE	RFC East	1224
RFCM	RFC Michigan	1680
RFCW	RFC West	1652
SRMW	SERC Midwest	1966
SRMV	SERC Mississippi Valley	1094
SRSO	SERC South	1601
SRTV	SERC Tennessee Valley	1623
SRVC	SERC Virginia/Carolina	1220
SPNO	SPP North	2106
SPSO	SPP South	1780
CAMX	WECC California	768
NWPP	WECC Northwest	958
RMPA	WECC Rockies	1999
AZNM	WECC Southwest	1391

a. Sources: EPA eGRID2007 Version 1.1, 2005 data; EPA eGrid regional gross grid loss factor.

Reason: The value for HICC Oahu is wrong. It is 10 times higher than it should be.

Cost Impact: Will not increase the cost of construction.

GEW36-14: TABLE 602.2.1-BAILEY602

GEW37-14

602.2.2, Table 602.2.2

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Revise as follows:

602.2.2 Onsite nonrenewable energy. Emissions associated with the use of nonrenewable energy sources other than electrical power such as natural gas, fuel oil, and propane shall be calculated by multiplying the fossil fuel energy used by the building and its site at the utility meter or measured point of delivery by the national emission factors in Table 602.2.2 and the conversions required by this section. Emissions associated with fossil fuels not specified in Table 602.2.2 shall be calculated by multiplying the fossil fuel used by the building at the utility meter or measured point of delivery by 250. Emissions associated with purchased district energy shall be calculated by multiplying the energy used by the building at the utility meter by 150 for hot water and steam, and for district cooling, the factors from ~~Table 602.2.2~~ Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.2
FOSSIL FUEL EMISSION FACTORS**

EMISSION RATE (lb/MMbtu HHV)	NATURAL GAS AS STATIONARY FUEL	FUEL OIL AS STATIONARY FUEL	PROPANE AS STATIONARY FUEL
CO ₂ e	137.35	200.63	162.85

For SI: MMBtu = 1,000,000 Btu = 10 terms: HHV = High-heating value.

Reason: Editorial. The phrase "at the utility meter or measured point of delivery" is used consistently in Section 602 and should be used in this paragraph as well. The Table reference has also been corrected (Table 602.2.2 does not have EPA eGRID Sub-regions).

Cost Impact: Will not increase the cost of construction.

GEW37-14: 602.2.2-BAILEY626

GEW38-14

602.2.3, 603.5.1

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Delete without substitution:

~~**602.2.3 Annual direct and indirect CO₂e emissions associated with onsite use of fossil fuels and purchased district energy.** Emissions associated with the use of natural gas, fuel oil and, propane shall be calculated by multiplying the natural gas, fuel oil, and propane delivered to the building at the utility meter by the corresponding emission factors in Table 602.2.2. Emissions associated with fossil fuels not listed shall be calculated by multiplying the fossil fuel delivered to the building at the utility meter by 250. Emissions associated with purchased district heating shall be calculated by multiplying the heating energy delivered to the building at the utility meter by 150 for hot water and steam, and for district cooling, the factors from Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.~~

Revise as follows:

603.5.1 Annual emissions. The data acquisition and management system shall be capable of providing the data necessary to calculate the annual CO₂e emissions associated with the operation of the building and its systems using the results of annual energy use measured in accordance with Section 603.5. The calculation shall be based on energy measured for each form of energy delivered to the site on an annual basis. Where reporting of emissions is required, the determination of emissions shall be in accordance with Section ~~602.2.3~~ 602.2.2.

Reason: Editorial. Section 602.2.3 is not referenced anywhere, and appears to contain only information that is already found in Section 602.2.2.

Cost Impact: Will not increase the cost of construction.

GEW38-14: 602.2.3-BAILEY622

GEW39-14

602.2.3, 603.5.1

Proponent: Neil Leslie, Gas Technology Institute, representing self
(neil.leslie@gastechnology.org)

Delete without substitution

~~**602.2.3 Annual direct and indirect CO₂e emissions associated with onsite use of fossil fuels and purchased district energy.** Emissions associated with the use of natural gas, fuel oil and, propane shall be calculated by multiplying the natural gas, fuel oil, and propane delivered to the building at the utility meter by the corresponding emission factors in Table 602.2.2. Emissions associated with fossil fuels not listed shall be calculated by multiplying the fossil fuel delivered to the building at the utility meter by 250. Emissions associated with purchased district heating shall be calculated by multiplying the heating energy delivered to the building at the utility meter by 150 for hot water and steam, and for district cooling, the factors from Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.~~

Revise as follows:

603.5.1 Annual emissions. The data acquisition and management system shall be capable of providing the data necessary to calculate the annual CO₂e emissions associated with the operation of the building and its systems using the results of annual energy use measured in accordance with Section 603.5. The calculation shall be based on energy measured for each form of energy delivered to the site on an annual basis. Where reporting of emissions is required, the determination of emissions shall be in accordance with ~~Section 602.2.3~~ Sections 602.2.1 and 602.2.2.

Reason: Sections 602.2.2 and 602.2.3 are entirely redundant. This proposal suggests deleting 602.2.3. Section 603.5.1 is also amended to remove the reference to 602.2.3 and adds the missing reference to 602.2.1 that should also be addressed for compliance in Section 603.5.1.

Cost Impact: Will not increase the cost of construction.

GEW39-14: 602.2.3-LESLIE971

GEW 40-14

603, 603.1, 603.1.1, 603.2, 603.2.1, 603.2.2, 603.2.3, 603.2.4, 603.2.5, 603.3, 603.3.1, 603.3.2, 603.3.3, 603.3.4, 603.3.5, 603.3.6, 603.3.7, 603.3.7.1, 603.3.7.2, 603.3.7.3, 603.3.7.4, 603.3.7.5, , 603.4, 603.4.1, 603.5, 603.5.1, 603.6

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner (craig.conner@mac.com)

Revise as follows:

603 ENERGY METERING, MONITORING AND REPORTING

603.1 Purpose Scope. ~~Buildings that consume energy shall comply with Section 603. The purpose of this section is to provide requirements that will ensure that buildings are constructed or altered in a way that will provide the capability for their energy use, production and reclamation to be measured, monitored and reported. This includes the design of energy distribution systems so as to isolate load types, the installation of or ability to install in the future meters, devices and a data acquisition system, and the installation of, or the ability to provide, public displays and other appropriate reporting mechanisms in the future.~~

~~All forms of energy delivered to the building and building site, produced on the building site or in the building and reclaimed at the building site or in the building shall be metered and all energy load types measured in accordance with this section.~~

This section requires the capability to meter purchased energy. These requirements include the capability to separate energy use by end use category and fuel type, and providing a data acquisition system.

603.1.1 Buildings with tenants. ~~In buildings with tenants, the metering required by Section 603.3 shall be collected for the entire building and for each tenant individually. Tenants shall have access to all data collected for their space.~~

603.2 Energy distribution design requirements and load in buildings Load type isolation. ~~Energy distribution systems within, on or adjacent to and serving a building shall be designed such that each primary circuit, panel, feeder, piping system or supply mechanism supplies only one energy use type as defined in Sections 603.2.1 through 603.2.5. The energy use type served by each distribution system shall be clearly designated on the energy distribution system with the use served, and adequate space shall be provided for installation of metering equipment or other data collection devices, temporary or permanent, to measure their energy use. The energy distribution system shall be designed to facilitate the collection of data for each of the building energy use categories in Section 603.4 and for each of the end use categories listed in Sections 603.2.1 through 603.2.5. Where there are multiple buildings on a building site, each building shall comply separately with the provisions of Section 603.~~

Exception: ~~Buildings designed and constructed such that the total usage of each of the load types described in Sections 603.2.1 through 603.2.5 shall be permitted to be measured through the use of installed sub-meters or other equivalent methods as approved.~~

Energy distribution systems shall be designed such that each primary circuit, panel, feeder, piping system or supply mechanism supplies only one energy end use category as specified in Section 603.3. The energy end use served by each distribution system shall be clearly designated on the energy distribution system.

603.2.1 HVAC system total energy use. ~~The HVAC system total energy use category shall include all energy used to heat, cool, and provide ventilation to the building including, but not limited to, fans, pumps, boiler energy, chiller energy and hot water.~~

603.2.2 Lighting system total energy use. ~~The lighting system total energy use category shall include all interior and exterior lighting used in occupant spaces and common areas.~~

603.2.3 Plug loads. ~~The plug loads energy use category shall include all energy use by devices, appliances and equipment connected to convenience receptacle outlets.~~

~~603.2.4 Process loads. The process loads energy use category shall include the energy used by any single load associated with activities within the building, such as, but not limited to, data centers, manufacturing equipment and commercial kitchens, that exceeds 5 percent of the peak connected load of the whole building.~~

~~603.2.5 Energy used for building operations loads and other miscellaneous loads. The category of energy used for building operations loads and other miscellaneous loads shall include all vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains and fireplaces, swimming pools, inground spas, snow melt systems, exterior lighting that is mounted on the building or used to illuminate building facades and the use of any miscellaneous loads in the building not specified in Sections 603.2.1 through 603.2.4.~~

~~603.3 Energy-type metering Separation of energy end use categories. Buildings shall be provided with the capability to determine energy use and peak demand as provided in this section for each of the energy types specified in Sections 603.3.1 through 603.3.7. Utility energy meters or supplemental sub-meters are permitted to be used to collect whole building data, and shall be equipped with a local data port connected to a data acquisition system in accordance with Section 603.5.~~

Energy metering shall be capable of separating and reporting the energy end use categories specified in this section. Where the same equipment provides HVAC and service water heating, the HVAC and service water heating end uses shall be permitted to be combined. Separation of energy use into other end use categories shall be permitted where approved as appropriate to the use of the building.

HVAC including, but not limited to, fans, pumps, boiler energy, and chiller energy.

Service hot water heating including any associated pumps.

Lighting including both interior and exterior lighting.

Building operations including vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains and fireplaces, swimming pools, snowmelt systems, and other building operations.

Plug loads include the electric energy used by devices, appliances, and equipment connected to convenience receptacle outlets.

Process loads. Energy used by any single process load that exceeds 5 percent of the projected energy expenditures for the whole building. Process loads include, but are not limited to, data centers, manufacturing equipment, commercial kitchens.

Total building energy use, separated by purchased fuel type.

Exceptions: The following shall not require separation into end use categories:

1. Buildings containing less than 25,000 square feet of conditioned space.
2. End use categories projected to be less than 5 percent of the building's energy expenditures.
3. Spaces that are projected to use an average of less than 2 watts per square foot for all purchased energy.

~~603.3.1 Gaseous fuels Use of utility energy meters. Gaseous fuels including, but not limited to, natural gas, LP gas, coal gas, hydrogen, landfill gas, digester gas and biogas shall be capable of being metered at the building site to determine the gross consumption and peak demand of each different gaseous fuel by each building on a building site. The installation of gas meters and related piping shall be in accordance with the *International Fuel Gas Code*.~~

Utility energy meters shall be permitted to be used to collect any data for which they satisfy the requirements of Section 603. Where utility energy meters provide the metered data, the

data acquisition system shall be capable of automatically integrating the utility meter data with the other data storage and reporting.

603.3.2 Liquid fuels. Metering system data. ~~Liquid fuels including, but not limited, to fuel oil, petroleum-based diesel, kerosene, gasoline, bio diesel, methanol, ethanol and butane shall be capable of being metered at the building site to allow a determination of the gross consumption and peak demand of each liquid fuel use by each building on a building site. The installation of meters and related piping shall be in accordance with the *International Mechanical Code*.~~

The metering system shall be capable of collecting hourly data automatically. The system shall be capable of storing not less than 36 months of data . The system shall be capable of transferring the data for use in monitoring or analysis in real time.

603.3.3 Solid fuels. ~~Solid fuels including, but not limited to, coal, charcoal, peat, wood products, grains, and municipal waste shall be capable of having their use determined at the building site to allow a determination of the gross consumption and peak demand of each solid fuel use by each building on a building site.~~

603.3.4 Electric power. ~~Electric power shall be capable of being metered at the building site to allow a determination of the gross consumption and peak demand by each building on a building site. The installation of electric meters and related wiring shall be in accordance with NFPA 70.~~

603.3.5 District heating and cooling. ~~Hot water, steam, chilled water, and brine shall be capable of being metered at the building site, or where produced on the building site, to allow a determination of the gross consumption of heating and cooling energy by each building on a building site. Energy use associated with the production of hot water, steam, chilled water or brine shall be determined based on the fuel used.~~

603.3.6 Combined heat and power. ~~Equipment and systems with a connected load greater than 125,000-Btu/hr (36.63 kW) providing combined heat and power (CHP) shall be capable of being metered to allow a determination of the gross consumption of each form of delivered energy to the equipment. The output of CHP shall be metered in accordance with the applicable portions of Section 603 based on the forms of output from the CHP.~~

603.3.7 Renewable and waste energy. ~~Equipment and systems providing energy from renewable or waste energy sources which is included in the determination of the building zEPI, shall be capable of being metered to allow a determination of the output of equipment and systems in accordance with Sections 603.3.7.1 through 603.3.7.5.~~

603.3.7.1 Solar electric. ~~Equipment and systems providing electric power through conversion of solar energy directly to electric power shall be capable of being metered so that the peak electric power (kW) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.~~

603.3.7.2 Solar thermal. ~~Equipment and systems providing heat to fluids or gases through the capture of solar energy shall be capable of being metered so that the peak thermal energy (Btu/h) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of heat captured (Btu) for delivery to the building and its systems can be determined intervals of 1 hour or less.~~

Exception: ~~Systems with a rated output of less than 100 kBtu/hr shall not be required to have the capacity to be metered.~~

603.3.7.3 Waste heat. ~~Equipment and systems providing energy through the capture of waste heat shall be capable of being metered so that the amount of heat captured and delivered to the building and its systems can be determined at intervals of 1 hour or less.~~

Exception: ~~Systems with a rated output of less than 100 kBtu/hr shall not be required to have the capacity to be metered.~~

603.3.7.4 Wind power systems. ~~Equipment and systems providing electric power through conversion of wind energy directly to electric power shall be capable of being metered so that the peak electric power (kW)~~

~~provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.~~

~~**603.3.7.5 Other renewable energy electric production systems.** Equipment and systems providing electric power through conversion of other forms of renewable energy directly to electric power shall be capable of being metered so that the peak electric power (kW) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.~~

~~**603.4 Energy load type submetering. Space for energy metering.** For buildings that are not less than 25,000 square feet (2323 m²) in *total building floor area* the energy use of the categories specified in Section 603.2 shall be metered through the use of sub-meters or other *approved*, equivalent methods meeting the capability requirements of Section 603.3.~~

~~For buildings exempted from the installation of end use category metering in Section 603.3, space shall be identified and reserved for the future installation of metering capable of compliance with Section 603.3.~~

~~**603.4.1 Buildings less than 25,000 square feet.** For buildings that are less than 25,000 square feet (2323 m²) in *total building floor area*, the energy distribution system shall be designed and constructed to accommodate the future installation of sub-meters and other *approved* devices in accordance with Section 603.4. This includes, but is not limited to, providing access to distribution lines and ensuring adequate space for the installation of sub-meters and other *approved* devices.~~

~~**603.5 Minimum energy measurement and verification.** Meters, sub-meters, and other *approved* devices installed in compliance with Sections 603.3 and 603.4 shall be connected to a data acquisition and management system capable of storing not less than 36 months worth of data collected by all meters and other *approved* devices and transferring the data in real time to a display as required in Section 603.6.~~

~~**603.5.1 Annual emissions.** The data acquisition and management system shall be capable of providing the data necessary to calculate the annual CO₂e emissions associated with the operation of the building and its systems using the results of annual energy use measured in accordance with Section 603.5. The calculation shall be based on energy measured for each form of energy delivered to the site on an annual basis. Where reporting of emissions is required, the determination of emissions shall be in accordance with Section 602.2.3.~~

~~**603.6 Energy display** A permanent, readily accessible and visible display shall be provided adjacent to the main building entrance or on a publicly available Internet web site. The display shall be capable of providing all of the following:~~

- ~~1. The current energy demand for the whole building level measurements, updated for each fuel type at the intervals specified in Section 603.3.~~
- ~~2. The average and peak demands for the previous day and the same day the previous year.~~
- ~~3. The total energy usage for the previous 18 months.~~

Reason: The section was overly complex. This proposal simplifies the provisions.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GEW 40-14: 603-KLEIN1202

GEW41-14

603.1.1

Proponent: Jim Edelson, New Buildings Institute, representing New Buildings Institute

Revise as follows:

603.1.1 Buildings with multiple tenants. In buildings with more than one tenant ~~tenants~~, the metering required by Section 603.3 shall be provided ~~collected~~ for the entire building and for each tenant space individually. ~~Tenants~~ Each tenant shall have access to all data collected for their space.

- **Exception:** Individual meters shall not be required for tenant spaces less than 5,000 square feet (465 m²).

Reason: The load type segregation requirements of Section 603.2 will require 3-5 meters to meet the tenant sub-metering requirements of Section 603.1.1, not just one (depending on which of the five load types are delivered to the tenant space). Since loads will, in most cases, need to be delivered separately to the tenant space, they will be required to be separately metered.

This exemption keeps the complexity and cost of the tenant sub-metering requirement down by exempting smaller tenant spaces while leaving it in place only for larger spaces.

Cost Impact: Will not increase the cost of construction.

GEW41-14: 603.1.1-EDELSON1069

GEW42-14

603.2, 603.2.1, 603.2.2, 603.2.3, 603.2.4, 603.2.5

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

603.2 Energy distribution design requirements and load type isolation in buildings. Energy distribution systems within, on or adjacent to and serving a building shall be designed such that each primary circuit, panel, feeder, piping system or supply mechanism supplies only one energy use type as ~~defined~~ specified in Sections 603.2.1 through 603.2.5 Table 603.2. The energy use type served by each distribution system shall be clearly designated on the energy distribution system with the use category served, and adequate space shall be provided for installation of metering equipment or other data collection devices, temporary or permanent, to measure their energy use. The energy distribution system shall be designed to facilitate the collection of data for each of the building energy use categories in Section 603.4 and for each of the end use categories ~~listed~~ specified in Sections 603.2.1 through 603.2.5. Table 603.2. Where there are multiple buildings on a building site, each building shall comply separately with the provisions of Section 603.

Exception: Buildings designed and constructed such that the total usage of each of the load types ~~described~~ specified in Sections 603.2.1 through 603.2.5 Table 603.2 shall be permitted to be measured through the use of installed sub-meters or other equivalent methods as *approved*.

**TABLE 603.2(1)
ENERGY USE CATEGORIES**

<u>Load Category</u>	<u>Description of energy use</u>
Total HVAC system	Heating, cooling and ventilation including, but not limited to fans, pumps, boilers, chillers and water heating.
Total lighting system	Interior and exterior lighting used in occupant spaces and common areas
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets
Process loads	Any single load of an activity within the building that exceeds 5 percent of the peak connected load of the whole building including, but not limited to data centers, manufacturing equipment and commercial kitchens
Building operations and other miscellaneous loads	Loads not included elsewhere in this table including, but not limited to, vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains, ornamental fireplaces, swimming pools, in-ground spas, snow-melt systems and exterior lighting that is mounted on the building or used to illuminate building facades

~~**603.2.1 HVAC system total energy use.** The HVAC system total energy use category shall include all energy used to heat, cool, and provide ventilation to the building including, but not limited to, fans, pumps, boiler energy, chiller energy and hot water.~~

~~**603.2.2 Lighting system total energy use.** The lighting system total energy use category shall include all interior and exterior lighting used in occupant spaces and common areas.~~

~~**603.2.3 Plug loads.** The plug loads energy use category shall include all energy use by devices, appliances and equipment connected to convenience receptacle outlets.~~

603.2.4 Process loads. ~~The process loads energy use category shall include the energy used by any single load associated with activities within the building, such as, but not limited to, data centers manufacturing equipment and commercial kitchens, that exceeds 5 percent of the peak connected load of the whole building.~~

603.2.5 Energy used for building operations loads and other miscellaneous loads. ~~The category of energy used for building operations loads and other miscellaneous loads shall include all vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains and fireplaces, swimming pools, inground spas, snow melt systems, exterior lighting that is mounted on the building or used to illuminate building facades and the use of any miscellaneous loads in the building not specified in Sections 603.2.1 through 603.2.4.~~

Reason: The format of the section is inconsistent with typical I-Code format. The subsections 603.2.1 through 603.2.5 do not contain any regulations but are merely descriptors (definitions) of 5 energy use (load) categories. The regulation contained in Section 603.2 requires each type of load /energy use to be separately metered. This proposal turns Sections 603.2.1 through 603.2.5 into a table of energy use types/categories. It then revises the paragraph to refer to the table. It also provides consistency in the language used regarding 'load types' and 'categories'. There were various proposals submitted for consideration in the IECC in 2013. While none were successful, most used this format to 'define' the loads. In addition to reformatting the 5 sections into a table, Section 603.2 has been edited to provide a consistent method of referring to the 5 categories. Currently the section and exception says the categories are "defined", "listed" and "described". This proposal replaces all three of those with the phrase 'specified in Table'.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction. The proposal is editorial in nature and does not change the actual regulation of any element.

GEW42-14: 603.2-THOMPSON567

GEW43-14

603.2

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org); Brenda Thompson, Chair, Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

603.2 Energy distribution design requirements and load type isolation in buildings. Energy distribution systems within, on or adjacent to and serving a building shall be designed such that each primary circuit, panel, feeder, piping system or supply mechanism supplies only one energy use type as defined in Sections 603.2.1 through 603.2.5. The energy use type served by each distribution system shall be clearly designated on the energy distribution system with the use served, and adequate space shall be provided for installation of metering equipment or other data collection devices, temporary or permanent, to measure their energy use. The energy distribution system shall be designed to facilitate the collection of data for each of the building energy use categories in Section 603.4 and for each of the end use categories listed in Sections 603.2.1 through 603.2.5. Where there are multiple buildings on a building site, each building shall comply separately with the provisions of Section 603.

Exceptions:

1. Buildings designed and constructed such that the total usage of each of the load types described in Sections 603.2.1 through 603.2.5 shall be permitted to be measured through the use of installed sub-meters or other equivalent methods as *approved*.
2. Within Group I-2, Condition 2 occupancies, loads connected to critical, life safety and equipment branches shall be permitted to be monitored in the aggregate.

Reason: These metering requirements place an undue burden on hospitals (Group I-2, Condition 2) that have very sophisticated and integrated power systems. Many times the critical, life safety and essential electric system may have lighting, process loads and equipment loads connected in the same panelboard. The need to meter to the circuit level is very costly and difficult to manage for loads that would not be managed or optional.

The Essential Electrical System within a hospital is a system comprised of alternate sources of power and all connected distribution systems and ancillary equipment, designed to ensure continuity of electrical power to designated areas and functions of a health care facility during disruptions of normal power sources and also to minimize disruption within the internal wiring system. The internal wiring system is segregated into three branches, the Life Safety Branch, the Critical Branch and the Equipment Branch. These branches divide and prioritize the criticality of the equipment and functions served by the electrical system and provide for a hierarchy of electrical service based on life safety and clinical services. The division between these branches occurs at transfer switches where more than one transfer switch is required. The Equipment Branch is a system of feeders and branch circuits arranged for delayed, automatic, or manual connection to the alternate power source and that services primarily 3-phase power equipment. The Equipment Branch serves such items as: central suction systems, sump pumps, compressed air systems serving medical and surgical functions, smoke control systems, stair pressurization systems, kitchen hood supply or exhaust systems, HVAC systems for airborne infections/isolation rooms, protective environment rooms, operating rooms, critical care units, labor and delivery units, emergency rooms and general patient rooms, and lab and other hazardous area hood.

The Critical Branch is a system of feeders and branch circuits supplying power for task illumination, fixed equipment, select receptacles, and select power circuits serving areas and functions related to patient care that are automatically connected to alternate power sources by one or more transfer switches during interruption of the normal power system. The Critical Branch serves task illumination, fixed equipment, select receptacles and select power circuits serving the following areas and functions related to patient care: airborne infections/isolation rooms, protective environment rooms, operating rooms, critical care units, labor and delivery units, emergency rooms and general patient rooms, and medication preparation areas, pharmacy dispensing areas, nurse call systems, blood banks. The Life Safety Branch is a system of feeders and branch circuits supplying power for lighting, receptacles, and equipment essential for life safety that are automatically connected to alternate power sources by one or more transfer switches during interruption of the normal power source. The Life Safety Branch is limited to circuits essential to life safety and supplies power for lights, receptacles and equipment for: illumination of the means of egress, exit signs, hospital communication systems, elevator cab lighting and control, fire alarms and loads dedicated to proper function and maintenance of the emergency power supply. As can be seen from the listing of components and areas served each branch of the essential electrical system within hospitals is distributed throughout the

facility. This is in direct conflict with the energy distribution design requirements and load type isolation in buildings required by Section 603.2. In order to allow for the proper power distribution design for hospitals this exception is necessary.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW43-14: 603.2-PAARLBERG430

GEW44-14

603.3.1

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org); Brenda Thompson, Chair, Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

603.3.1 Gaseous fuels. Gaseous fuels including, but not limited to, natural gas, LP gas, coal gas, hydrogen, landfill gas, digester gas and biogas shall be capable of being metered at the building site to determine the gross consumption and peak demand of each different gaseous fuel by each building on a building site. The installation of gas meters and related piping shall be in accordance with the *International Fuel Gas Code*.

Exception: Gaseous fuels used for clinical purposes are not required to be metered.

Reason: Hospitals use flammable gaseous fuel in limited quantities due to their fire risk. Examples include ethylene oxide, hydrogen, methane which are used for clinical purposes such as sterilization and laboratory purposes. Since these are delivered in finite quantities, consumption can be monitored by reviewed the supplier's manifest records. Gases used for clinical purposes should not be required to be sub-metered to be able to determine the gross consumption and peak demand.

Other examples of non-flammable gases that could be considered as "fuel" include nitrogen. This could be considered a "fuel" as drives pneumatic patient care equipment such as drills, saws, operating room booms, etc. Gases used for these types of clinical purposes are not fuels, so with no energy component, this should not be a requirement in the Green code.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW44-14: 603.3.1-PAARLBERG432

GEW45-14

603.3.1

Proponent: Bruce Swiecicki, National Propane Gas Association, representing self
(bswecicki@npga.org)

Revise as follows:

603.3.1 Gaseous fuels. Gaseous fuels including, but not limited to, natural gas, LP gas, coal gas, hydrogen, landfill gas, digester gas and biogas shall be capable of being metered at the building site to determine the gross consumption and peak demand of each different gaseous fuel by each building on a building site. The installation of gas meters and related piping shall be in accordance with the *International Fuel Gas Code*.

Exception: Gaseous fuels stored and replenished on site shall not be required to be metered for peak demand.

Reason: The concept of measuring and controlling "peak demand" at the building site is based on two primary considerations. First, controlling the peak demand at the building site allows the building owner or occupants to reduce their energy consumption during a time period that the energy provider is charging higher than normal prices for energy delivered to the building. Secondly, the reason energy providers charge more for energy during periods of peak consumption is that the energy "grid" or delivery infrastructure is to avoid operating the system at maximum or near maximum capacity. Sustained operation at these levels can potentially bring the system down in a "crash," leading to a brownout or blackout condition. Therefore, building owners and occupants relying on energy sources that are not within their control have an incentive to monitor and control the use of that energy during peak demand periods.

Buildings utilizing propane as an energy source are not subject to the same constraints as other energy sources. The source of propane is stored in a container on the building property and the container is replenished with propane periodically to maintain a steady supply. The building owner or occupants have already paid for the energy in the propane container and therefore are not subject to increased pricing during periods of heavier than normal use.

It is important to note that each ASME propane container is already provided with a volumetric liquid level gauge that is used to determine the remaining amount of propane in the container, which satisfies the requirement in 603.3.1 for metering the gross consumption of gas.

To summarize, the requirement for peak demand metering for gaseous fuel systems that are stored and replenished on site is a requirement that serves no useful purpose while imposing a needless burden on the building owner. It must be removed from the code.

Cost Impact: Will not increase the cost of construction.

GEW 45-14: 603.3.1-SWIECICKI797

GEW46-14

603.3.2

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee
(AHC@iccsafe.org)

Revise as follows:

603.3.2 Liquid fuels. Liquid fuels including, but not limited, to fuel oil, petroleum-based diesel, kerosene, gasoline, bio diesel, methanol, ethanol and butane shall be capable of being metered at the building site to allow a determination of the gross consumption and peak demand of each liquid fuel use by each building on a building site. The installation of meters and related piping shall be in accordance with the *International Mechanical Code*.

Exception: Stationary reciprocating internal combustion engines (RICE) provided for emergency and standby power are not required to be metered.

Reason: Certain stationary reciprocating internal combustion engines (RICE) are maintained in order to be able to respond to emergency power needs. The EPA allows exceptions for the emissions requirements for these generators as listed below in 40 CFR § 63.6640 Paragraph (f) and metering these for gross consumption and peak demand is an undue burden.

EPA § 63.6640 Paragraph (f) Requirements for emergency stationary RICE.

(1) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a new or reconstructed emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed on or after June 12, 2006, or an existing emergency stationary RICE located at an area source of HAP emissions, you must operate the emergency stationary RICE according to the requirements in paragraphs (f)(1)(i) through (iii) of this section. Any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1)(i) through (iii) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1)(i) through (iii) of this section, the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines.

(i) There is no time limit on the use of emergency stationary RICE in emergency situations.

(ii) You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency RICE beyond 100 hours per year.

(iii) You may operate your emergency stationary RICE up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity; except that owners and operators may operate the emergency engine for a maximum of 15 hours per year as part of a demand response program if the regional transmission organization or equivalent balancing authority and transmission operator has determined there are emergency conditions that could lead to a potential electrical blackout, such as unusually low frequency, equipment overload, capacity or energy deficiency, or unacceptable voltage level. The engine may not be operated for more than 30 minutes prior to the time when the emergency condition is expected to occur, and the engine operation must be terminated immediately after the facility is notified that the emergency condition is no longer imminent. The 15 hours per year of demand response operation are counted as part of the 50 hours of operation per year provided for non-emergency situations. The supply of emergency power to another entity or entities pursuant to financial arrangement is not limited by this paragraph (f)(1)(iii), as long as the power provided by the financial arrangement is limited to emergency power.

(2) If you own or operate an emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed prior to June 12, 2006, you must operate the engine according to the conditions described in paragraphs (f)(2)(i) through (iii) of this section. If you do not operate the engine according to the requirements in paragraphs (f)(2)(i) through (iii) of this section, the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines.

(i) There is no time limit on the use of emergency stationary RICE in emergency situations.

(ii) You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by the manufacturer, the vendor, or the insurance company associated with the engine. Required testing of such units should be minimized, but there is no time limit on the use of emergency stationary RICE in emergency situations and for routine testing and maintenance.

(iii) You may operate your emergency stationary RICE for an additional 50 hours per year in non-emergency situations. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW46-14: 603.3.2-PAARLBERG436

GEW47-14

603.3.7.1, 603.3.7.2, 603.3.7.3, 603.3.7.4, 603.3.7.5

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

603.3.7.1 Solar electric. Equipment and systems providing electric power through conversion of solar energy directly to electric power shall be capable of being metered so that the peak electric power (kW) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.

Exception: Systems with a rated output of less than 3 kW shall not be required to have the capacity to be metered.

603.3.7.2 Solar thermal. Equipment and systems providing heat to fluids or gases through the capture of solar energy shall be capable of being metered so that the peak thermal energy (Btu/h) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of heat captured (Btu) for delivery to the building and its systems can be determined intervals of 1 hour or less.

Exception: Systems with a rated output of less than ~~400~~ 25 kBtu/hr shall not be required to have the capacity to be metered.

603.3.7.3 Waste heat. Equipment and systems providing energy through the capture of waste heat shall be capable of being metered so that the amount of heat captured and delivered to the building and its systems can be determined at intervals of 1 hour or less.

Exception: Systems with a rated output of less than ~~400~~ 25 kBtu/hr shall not be required to have the capacity to be metered.

603.3.7.4 Wind power systems. Equipment and systems providing electric power through conversion of wind energy directly to electric power shall be capable of being metered so that the peak electric power (kW) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.

Exception: Systems with a rated output of less than 3 kW shall not be required to have the capacity to be metered.

603.3.7.5 Other renewable energy electric production systems. Equipment and systems providing electric power through conversion of other forms of renewable energy directly to electric power shall be capable of being metered so that the peak electric power (kW) provided to the building and its systems or to off-site entities can be determined at 15-minute intervals and the amount of electric power (kWh) provided to the building and its systems can be determined at intervals of 1 hour or less.

Exception: Systems with a rated output of less than 3 kW shall not be required to have the capacity to be metered.

Reason: Currently, renewable energy systems that produce thermal energy do not have to be metered if the output is less than 100,000 Btu per hour. However, all renewable energy systems that produce electric energy have to be metered, even if the output is as low as 1 Watt (3.413 Btu's per hour).

The proposed changes are designed to ensure that very small systems, regardless of whether they produce electric or thermal energy, are exempt from these requirements.

Cost Impact: Will not increase the cost of construction.

GEW47-14: 603.3.7.1-ROSENSTOCK530

GEW48-14

603.3.7.2, Chapter 12

Proponent: Jim Huggins, Solar Rating & Certification Corp., representing Solar Rating & Certification Corp.

Revise as follows:

603.3.7.2 Solar thermal. Equipment and systems providing heat to fluids or gases through the capture of solar energy shall be capable of being metered so that the peak thermal energy (Btu/h) provided to the building and its systems or to off-site entities can be determined at 15- minute intervals and the amount of heat captured (Btu) for delivery to the building and its systems can be determined intervals of 1 hour or less.

Exception: Systems with a rated output of less than 100 kBtu/hr shall not be required to have the capacity to be metered. The rated output shall be determined using listed and labeled solar collectors that have been tested in accordance with SRCC 100.

Add new standard as follows:

SRCC

Solar Rating & Certification Corporation
400 High Point Drive, Suite 400
Cocoa, FL 32926

SRCC 100-2013-11 Minimum Standards for Solar Thermal Collectors

Reason: This section provides an exception to the requirement to meter solar thermal systems, but does not explain how to calculate the rated output of the system. This proposal adds a requirement to comply with the nationally recognized standard for solar collectors. This requirement is in the IRC, but not in the IMC or the IECC, so it is needed here to cover non-residential systems.

Compliance with the standard will provide the information needed by the design professional to calculate the rated output of the system.

Cost Impact: Will not increase the cost of construction. Certification of solar thermal collectors is already required by incentive programs, utilities, and many states so most solar thermal collectors are already certified and the efficiency equations are published. Rather than increasing the cost of construction, this modification should lower it by make it easier for the design professional to determine compliance with the 100kBtu/hr requirement.

Analysis: A review of the standard proposed for inclusion in the code, SRCC 100-2013--11, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW48-14: 603.3.7.2-HUGGINS1086

GEW49-14

603.3.7.6 (New), 603.3.7.7 (New)

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Add new text as follows:

603.3.7.6 Biogas energy systems. Equipment and systems providing energy through the use of biogas shall be capable of being metered so that the amount of heat captured and delivered to the building and its systems can be determined at intervals of 1 hour or less.

Exception: Systems with a rated output of less than 25 kBtu/hr shall not be required to have the capacity to be metered.

603.3.7.7 Biomass energy systems. Equipment and systems providing energy through the use of biomass shall be capable of being metered so that the amount of heat captured and delivered to the building and its systems can be determined at intervals of 1 hour or less.

Exception: Systems with a rated output of less than 25 kBtu/hr shall not be required to have the capacity to be metered.

Reason: The proposed changes will make this section consistent with other proposals to ensure that biogas and biomass energy systems are allowed to be used to meet the renewable energy requirements of this section.

In addition, the exception language is consistent with other proposals to exempt smaller systems from having to be metered.

Cost Impact: Will increase the cost of construction.

GEW49-14: 603.3.7.6 (NEW)-ROSENSTOCK532

GEW50-14

603.4, 603.4.1

Proponent: Paul Cabot, American Gas Association, representing American Gas Association (pcabot@aga.org)

Revise as follows:

603.4 Energy load type sub-metering. For buildings that are not less than 25,000 square feet (2323 m²) in *total building floor area* the electric energy use of the categories specified in Section 603.2 shall be metered through the use of sub-meters or other *approved*, equivalent methods meeting the capability requirements of Section 603.3.

603.4.1 Buildings less than 25,000 square feet. For buildings that are less than 25,000 square feet (2323 m²) in *total building floor area*, the electric energy distribution system shall be designed and constructed to accommodate the future installation of sub-meters and other *approved* devices in accordance with Section 603.4. This includes, but is not limited to, providing access to distribution lines and ensuring adequate space for the installation of sub-meters and other *approved* devices.

Reason: The two sections are being revised to limit sub metering to electric only. The imposition of sub metering for natural gas and other energy sources result in significant installation cost increases without any known energy conservation benefit. Electric energy sub metering can utilize utility rate structures and incentives to shed demand and control equipment operation scheduling, providing a economic benefit. Electrically driven equipment and systems vastly outnumber applications driven by natural gas and other energy sources. Electrically driven HVAC, refrigeration, lighting, pumps, fans, AV, plug loads, etc., offer economic opportunities for central motoring and control that sub meters could be used for. Natural gas and other energy source driven appliances mainly are space and water heating, and offer little control opportunities and no economic benefit for consumers and building users. While there may be some reporting applications that make sense for sub metering of natural gas and other energy sources, those opportunities do not justify code mandated installations.

Cost Impact: Will not increase the cost of construction.

GEW50-14: 603.4-CABOT753

GEW51-14

603.5

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org); Brenda Thompson, Chair, representing Sustainability, Energy, High Performance code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

603.5 Minimum energy measurement and verification. Meters, sub-meters, and other *approved* devices installed in compliance with Sections 603.3 and 603.4 shall be connected to a data acquisition and management system capable of storing not less than 36-months worth of data collected by all meters and other *approved* devices and transferring the data in real time to a display as required in Section 603.6.

Exception: Stationary reciprocating internal combustion engines (RICE) provided for emergency and standby power are not required to be connected to a data acquisition and management system.

Reason: Certain stationary reciprocating internal combustion engines (RICE) are maintained in order to be able to respond to emergency power needs. The EPA allows exceptions for the emissions requirements for these generators as listed below in 40 CFR § 63.6640 Paragraph (f) and metering these for gross consumption and peak demand is an undue burden.

EPA § 63.6640 Paragraph (f) Requirements for emergency stationary RICE.

(1) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a new or reconstructed emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed on or after June 12, 2006, or an existing emergency stationary RICE located at an area source of HAP emissions, you must operate the emergency stationary RICE according to the requirements in paragraphs (f)(1)(i) through (iii) of this section. Any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1)(i) through (iii) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1)(i) through (iii) of this section, the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines.

(i) There is no time limit on the use of emergency stationary RICE in emergency situations.

(ii) You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency RICE beyond 100 hours per year.

(iii) You may operate your emergency stationary RICE up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity; except that owners and operators may operate the emergency engine for a maximum of 15 hours per year as part of a demand response program if the regional transmission organization or equivalent balancing authority and transmission operator has determined there are emergency conditions that could lead to a potential electrical blackout, such as unusually low frequency, equipment overload, capacity or energy deficiency, or unacceptable voltage level. The engine may not be operated for more than 30 minutes prior to the time when the emergency condition is expected to occur, and the engine operation must be terminated immediately after the facility is notified that the emergency condition is no longer imminent. The 15 hours per year of demand response operation are counted as part of the 50 hours of operation per year provided for non-emergency situations. The supply of emergency power to another entity or entities pursuant to financial arrangement is not limited by this paragraph (f)(1)(iii), as long as the power provided by the financial arrangement is limited to emergency power.

(2) If you own or operate an emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed prior to June 12, 2006, you must operate the engine according to the conditions described in paragraphs (f)(2)(i) through (iii) of this section. If you do not operate the engine according to the requirements in paragraphs (f)(2)(i) through (iii) of this section, the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines.

(i) There is no time limit on the use of emergency stationary RICE in emergency situations.

(ii) You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by the manufacturer, the vendor, or the insurance company associated with the engine. Required testing of such units should be minimized, but there is no time limit on the use of emergency stationary RICE in emergency situations and for routine testing and maintenance.

(iii) You may operate your emergency stationary RICE for an additional 50 hours per year in non-emergency situations. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW51-14: 603.5-PAARLBERG437

GEW52-14

603.5.1, 603.6

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

603.5.1 Annual Daily and annual direct and indirect emissions. The data acquisition and management system shall be capable of providing the data necessary to calculate the daily and annual direct and indirect CO₂e emissions associated with the operation of the building and its systems using the results of daily and annual energy use measured in accordance with Section 603.5 or the results of on-site emissions monitoring. The calculation shall be based on energy measured for each form of energy delivered to the site on ~~an~~ a daily or annual basis. Where reporting of emissions is required, the determination of emissions shall be in accordance with Section 602.2.3 or through the use of an on-site emissions monitoring system.

603.6 Energy and emissions display. A permanent, readily accessible and visible display shall be provided adjacent to the main building entrance or on a publicly available Internet web site. The display shall be capable of providing all of the following:

1. The current energy demand for the whole building level measurements, updated for each fuel type at the intervals specified in Section 603.3.
2. The average and peak demands for the previous day and the same day the previous year.
3. The total energy usage for the previous ~~48~~ 13 months.
4. The current direct emissions for building equipment, updated for each fuel type.
5. The total direct emissions of building equipment for the previous day and the same day the previous year.
6. The total direct emissions of building equipment for the previous 13 months.

Reasons: The proposed changes improve this section for the following reasons:

- It requires reporting of direct and indirect emissions, which will vary considerably based on the type of energy used in building appliances and equipment.
- It requires the reporting of daily emissions, so that building owners may be alerted to equipment maintenance issues if there is a dramatic change in direct emissions (e.g., incomplete combustion leading to higher CO₂e emissions).
- It allows more flexibility for the reporting, by providing a choice of the use of on-site emissions monitors or the use of approved calculation methods.
- It requires the display to show emissions as well as energy information.
- It provides building specific emissions information that will be useful to building owners, occupants, and visitors.
- It breaks out the emissions information by fuel type, to allow parties to see the different amounts of emissions from different equipment.

Also, changing the recording period from 18 to 13 months will allow users to see the actual information for a year that is provided by energy suppliers based on their billing periods. For example, a "January" billing period may end on January 3, but show data that mostly covers the December calendar month (December 3 to January 3). So the January 2014 display will have information from December 2012 through December 2013, based on the information provided by the energy supplier. Then the data from the daily emissions calculations or monitoring can be aligned with the energy supplier billing periods for the display.

Cost Impact: Will not increase the cost of construction.

GEW52-14: 603.5.1-ROSENSTOCK536

GEW 53-14 604

Proponent: Gary Klein, Affiliated International Management, LLC, representing self
(gary@aim4sustainability.com)

Delete without substitution:

~~604 AUTOMATED DEMAND RESPONSE (AUTO-DR) INFRASTRUCTURE~~

Reason: This section is too complicated, expensive and does not apply to many utilities.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GEW 53-14: 604-KLEIN1206

GEW54-14

202, 604.1, 604.2, 604.3, 604.3.1 (New), 604.4, 611.3.3.5 (New)

Proponent: Jim Edelson, New Buildings Institute, representing New Buildings Institute; Ryan Meres, Institute for Market Transformation (ryan@imt.org)

Add new definition(s) as follows:

DEMAND RESPONSE PERIOD: A period of time during which electricity or other fuel loads are modified in response to a demand response signal.

DEMAND RESPONSE SIGNAL: A signal sent by the local utility, independent system operator (ISO), or designated curtailment service provider or aggregator, to a customer, indicating a price or a request to modify electricity consumption, for a limited time period.

DEMAND RESPONSE ZONE: A defined area within the building or building site from which a demand response signal can be received, an area to which a demand response signal can be sent, or an area in which a form of control can be executed.

Critical: A demand response zone serving a process where reset of the zone temperature setpoint during a demand shed event might disrupt the process, including but not limited to data centers, telecom and private branch exchange (PBX) rooms, and laboratories

Non-Critical: A demand response zone that is not defined as critical.

OCCUPANT CONTROLLED SMART THERMOSTAT. A control device that is capable of both receiving and responding to demand response signals with occupant override capabilities.

Revise as follows:

604.1 Establishing an open and interoperable automated demand-response (Auto-DR) infrastructure. Where this section is indicated to be applicable in Table 302.1, buildings that contain heating, ventilating, air-conditioning (HVAC) or lighting systems shall comply with Sections 604.1 through 604.4. A building energy management and control system (EMCS) shall be provided and integrated with building HVAC systems controls and lighting systems controls to receive an open and interoperable automated demand response (Auto-DR) relay or Internet signal. Building HVAC and lighting systems and specific building energy using components shall incorporate preprogrammed demand response strategies that are automated with a demand response automation Internet software client.

Exception: Auto-DR infrastructure is not required for the following:

1. Buildings located where the electric utility or regional Independent System Operator (ISO) or Regional Transmission Operator (RTO) does not offer a demand response program to buildings regulated by this code.
2. Buildings with a peak electric demand not greater than 0.75 times that of the standard reference design.
3. Buildings that have incorporated onsite renewable energy generation to provide 20 percent or more of the building's energy demand.

Where this section is indicated to be applicable in Table 302.1, buildings that contain heating, ventilating, air-conditioning (HVAC) or lighting systems shall comply with Sections 604.1 through 604.4.

Exception: Auto-DR infrastructure is not required for the following buildings and systems:

1. Buildings located where the electric utility or regional independent system operator (ISO) or regional transmission operator (RTO) does not offer a demand response program to buildings regulated by this code.
2. Buildings with onsite renewable energy systems that have a minimum rated capacity no less than 20 percent of the building's peak energy demand.
3. Hospitals and critical emergency response facilities.
4. Spaces used for hazardous materials storage.
5. Building smoke exhaust systems.
6. Manufacturing process systems
7. Buildings with passive or active features that show peak electric energy use reduction of 15 percent or more during demand response periods identified by the code official. Modeled peak energy use shall be determined in accordance with Section 602 and shall demonstrate that the building reduces modeled peak daily electric energy use by not less than 15 percent from the baseline building for the demand response period identified by the code official.
8. Systems serving process loads where constant temperatures are necessary to prevent degradation of plants, animals, or other temperature-sensitive materials.

604.2 Software clients Heating, ventilation and air-conditioning (HVAC) systems equipped with direct digital control (DDC). ~~Demand response automation software clients shall be capable of communicating with a demand response automation server via the Internet or other communication relay.~~

HVAC systems with direct digital control (DDC) to the zone level shall be programmed to allow centralized demand shed for non-critical zones in accordance with the following:

1. The controls shall have a capability to remotely setup the operating cooling temperature set points by 4 degrees F. (2.2 degrees C) or more in all non-critical zones on signal from a centralized contact or software point within an energy management control system (EMCS).
2. The controls shall have a capability to remotely setdown the operating heating temperature set points by 4 degrees F. (2.2 degrees C) or more in all non-critical zones on signal from a centralized contact or software point within an EMCS.
3. The controls shall have capabilities to remotely reset the temperatures in all non-critical zones to original operating levels on signal from a centralized contact or software point within an EMCS.
4. The controls shall be programmed to provide an adjustable rate of change for the temperature setup and reset.
5. The controls shall have the following features:
 - 5.1. Be accessible to authorized facility operators.
 - 5.2. Be equipped with a manual control to allow adjustment of heating and cooling set points globally from a single point.
 - 5.3. Shall direct the space-conditioning systems to conduct a centralized demand shed, as specified for non-critical zones during the demand response period, upon receipt of a demand response signal.

604.3 Heating, ventilating and air-conditioning (HVAC) systems not equipped with DDC. The Auto-DR strategy for HVAC systems shall be capable of reducing the building peak cooling or heating HVAC demand by not less than 10 percent when signaled from the electric utility, regional independent system operator (ISO) or regional transmission operator (RTO), through any combination of the strategies and systemic adjustments, including, but not limited to the following:

1. Space temperature setpoint reset.
2. Increasing chilled water supply temperatures or decreasing hot water supply temperatures.
3. Increasing or decreasing supply air temperatures for variable air volume (VAV) systems.
4. Limiting capacity of HVAC equipment that has variable or multiple stage capacity control.
5. Cycling of HVAC equipment or turning off noncritical equipment.
6. Disabling HVAC in unoccupied areas.
7. Limiting the capacity of chilled water, hot water, and refrigerant control valves.
8. Limiting the capacity of supply and exhaust fans, without reducing the outdoor air supply below the minimum required by Chapter 4 of the *International Mechanical Code*, or the minimum required by ASHRAE 62.1.
9. Limiting the capacity of chilled water or hot water supply pumps.
10. Anticipatory control strategies to precool or preheat in anticipation of a peak event.

Exception: The Auto-DR strategy is not required to include the following buildings and systems:

1. Hospitals and critical emergency response facilities.
2. Life safety ventilation for hazardous materials storage.
3. Building smoke exhaust systems.
4. Manufacturing process systems.

Unitary heating or cooling systems, including heat pumps, not controlled by a central energy management control system (EMCS) shall have an occupant controlled smart thermostat in accordance with Section 604.3.1.

EXCEPTION: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves, room air conditioners, and room air-conditioner heat pumps.

604.3.1 Occupant controlled smart thermostat (OCST). Occupant controlled smart thermostats (OCST) shall be capable of the following:

1. OCSTs shall include communication capabilities through either:
 - 1.1. Not less than one expansion port that allows for the installation of a removable module containing a radio or physical connection port to enable communication; or
 - 1.2. Onboard communication devices.
2. OCSTs shall be capable of both receiving and responding to demand response signals.
3. Event modes shall be capable of being overridden by the occupant.
4. OCSTs, with communications enabled, shall be capable of receiving and automatically responding to demand response signals by adjusting the thermostat setpoint by either the default number of degrees or the number of degrees established by the occupant.
5. In response to demand response signals, the OCST shall default to an event response that initiates setpoint offsets of +4°F for cooling and -4°F for heating relative to the current setpoint.
6. OCSTs shall be capable of manual adjustments to event responses, thermostat settings and setpoints at any time, including during demand response periods.
7. OCSTs shall have the capability to display information to the occupant including, but not limited to, communications system connection status, an indication that a demand response period is in progress, the currently sensed temperature and the current setpoint.

604.4 Lighting. In Group B office spaces, the Auto-DR system shall be capable of reducing total connected power of lighting as determined in accordance with Section C405.5 of the *International Energy Conservation Code* by not less than 15 percent.

Exception: The following buildings and lighting systems need not be addressed by the Auto-DR system:

1. Buildings or portions associated with lifeline services.
2. Luminaires on emergency circuits.
3. Luminaires located in emergency and life safety areas of a building.
4. Lighting in buildings that are less than 5,000 square feet (465 m²) in total area.
5. Luminaires located within a daylight zone that are dimmable and connected to automatic *daylight controls* complying with Section C405.2.2.3.2 of the *International Energy Conservation Code*.
6. Signage used for emergency, life safety or traffic control purposes.

Where buildings have a floor area greater than 10,000 square feet, the Auto-DR system shall be capable of reducing the total connected lighting power by not less than 15 percent. The lighting power shall be determined in accordance with Section C405.5 of the *International Energy Conservation Code*.

Exception: The following buildings and lighting systems need not be addressed by the Auto-DR system:

1. Luminaires or signage on emergency circuits.
2. Luminaires located within a *daylight zone* that are dimmable and connected to automatic *daylight controls* in accordance with the *International Energy Conservation Code*.
3. Luminaires or signage for which a lighting power reduction would endanger patient care, occupant safety or occupant security.

611.3.3.5 Auto D-R Controls For auto-DR lighting controls, the engagement of a shedding event shall be tested for light reduction to preset illuminance levels, and disengagement of a shedding event shall be tested for restoration to their original values.

Reason: The proposed Section 604 supports greater DR participation by simplifying and standardizing the Auto-DR application to HVAC by describing three distinct situations: Energy Management Systems, Direct Digital Control, and Smart Thermostats. This equipment controls HVAC systems in non-critical zones. The systems are also able to communicate the changes in order for the building owner or operator to be compensated for responding to the price signal or demand response period. Section 604 proposed language requires that occupants can override system settings and calls out exceptions for certain types of equipment and sensitive or critical environments. Section 604.3.1 also ensures that the Auto-DR technology slowly return systems to normal operations in order to avoid rebound peaks. Relying on California Title 24's existing approach to HVAC controls and standardized communications protocols, the proposal provides simplified automated demand response (Auto-DR) infrastructure and communications language in Section 604.

Exception 7 addresses areas where passive load reduction can forestall the need for more aggressive demand reduction while at the same time reducing overall building energy use on an on-going basis. The proposed exception would provide an alternate approach to projects that would encourage the adoption of meaningful passive design strategies while also contributing to long-term grid stability. Features and systems that may allow buildings to qualify for this exemption include:

- actively controlled interior daylighting systems,
- thermal mass used actively to manage building internal temperatures as part of a night-ventilation control strategy,
- buildings designed to prevent direct solar penetration in cooling dominated climates,
- other building systems reviewed and approved by the AHJ

Sections 604.3.1 (Rebound Avoidance) is unchanged from the 2012 IgCC. Section 604.4 (Lighting) provisions are unchanged, but the scope extends beyond offices but coverage is reduced to building over 10000 square feet rather than 5000 square feet. Section 611.3.3.5 is added to describe the functional testing requirements for Auto-DR lighting reduction controls. And a row is added to the Commissioning Table 903.1 since that table includes a row for Lighting Auto-DR controls but not for HVAC Lighting Auto-DR-Controls.

While the market will continue to incorporate auto-DR technology and communications into buildings, it is critical that the proposed language be incorporated into the IgCC to facilitate faster and more cost-effective adoption of DR and pricing programs that address changing electricity consumption demand patterns nationwide. With the proposed language in place, there will be benefits to both building energy consumers and electricity systems, and support provided to the grid that will avoid additional infrastructure expenses. Many states, utility commissions, and independent system operators (ISOs) are considering

or already have DR and pricing programs and are exploring frameworks to accelerate and expand their role. Not only do these programs create system-wide benefits, but responsive demand in buildings has an enormous opportunity to contribute to the grid at a local distribution level, ensuring that the grid has resources at the right places at the right times. By standardizing Auto-DR system controls with this proposal, commercial buildings will become an even greater resource to very broad grid optimization efforts.

Cost Impact: Will not increase the cost of construction.

GEW54-14: 604.1-EDELSON1071

GEW55-14

302.1, 604.1

Proponent: Meg Waltner, National Resources Defense Council, representing Natural Resources Defense Council (mwaltner@nrdc.org)

Revise as follows:

604.1 Establishing an open and interoperable automated demand-response (Auto-DR) infrastructure. ~~Where this section is indicated to be applicable in Table 302.1,~~ Buildings that contain heating, ventilating, air-conditioning (HVAC) or lighting systems shall comply with Sections 604.1 through 604.4. A building energy management and control system (EMCS) shall be provided and integrated with building HVAC systems controls and lighting systems controls to receive an open and interoperable automated demand-response (Auto-DR) relay or Internet signal. Building HVAC and lighting systems and specific building energy-using components shall incorporate preprogrammed demand response strategies that are automated with a demand response automation Internet software client.

Exception: Auto-DR infrastructure is not required for the following:

1. Buildings located where the electric utility or regional Independent System Operator (ISO) or Regional Transmission Operator (RTO) does not offer a demand response program to buildings regulated by this code.
2. Buildings with a peak electric demand not greater than 0.75 times that of the standard reference design.
3. Buildings that have incorporated onsite renewable energy generation to provide 20 percent or more of the building's energy demand.

Revise as follows:

302.1 Requirements determined by the jurisdiction. The jurisdiction shall indicate the following information in Table 302.1 for inclusion in its code adopting ordinance:

1. The jurisdiction shall indicate whether requirements for residential buildings, as indicated in Exception 1 to Section 101.3, are applicable by selecting "Yes" or "No" in Table 302.1. Where "Yes" is selected, the provisions of ICC 700 shall apply and the remainder of this code shall not apply.
2. Where the jurisdiction requires enhanced energy performance for buildings designed on a performance basis, the jurisdiction shall indicate a zEPI of 46 or less in Table 302.1 for each occupancy required to have enhanced energy performance.
3. Where "Yes" or "No" boxes are provided, the jurisdiction shall check the box to indicate "Yes" where that section is to be enforced as a mandatory requirement in the jurisdiction, or "No" where that section is not to be enforced as a mandatory requirement in the jurisdiction.

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

Section	Section Title or Description and Directives	Jurisdictional Requirements	
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO₂e EMISSION REDUCTION			
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: _____ zEPI: _____	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(portions of table not shown remain unchanged)

Reason: This proposal would make the automated demand-response infrastructure requirement applicable to all jurisdictions. Demand response is becoming an increasingly important tool to manage demand on the grid and integrate variable energy resources. Most recently, demand response played a critical role in preventing power outages during the extreme cold temperatures in January 2014. Demand response capabilities are easiest and cheapest to integrate into a building when it is first constructed and building systems and their controls are first installed. Many utilities, ISOs and RTOs already offer demand response programs and the number of programs and the need for demand response is only likely to grow going forward. Given the high benefits of and need for demand response, and the relative ease and low cost of integrating these capabilities at the time of construction, we recommend making the automated demand-response infrastructure requirement applicable in all jurisdictions that adopt the IgCC.

Cost Impact: Will increase the cost of construction.

GEW55-14: 604.1 #2-WALTNER1127

GEW56-14

604.1, 604.4

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (rosenstock@eei.org)

Revise as follows:

604.1 Establishing an open and interoperable automated demand-response (Auto-DR) infrastructure. Where this section is indicated to be applicable in Table 302.1, buildings that contain heating, ventilating, air-conditioning (HVAC) or lighting systems shall comply with Sections 604.1 through 604.4. A building energy management and control system (EMCS) shall be provided and integrated with building HVAC systems controls and lighting systems controls to receive an open and interoperable automated demand-response (Auto-DR) relay or Internet signal. Building HVAC and lighting systems and specific building energy-using components shall incorporate preprogrammed demand response strategies that are automated with a demand response automation Internet software client.

Exception: Auto-DR infrastructure is not required for the following:

1. Buildings located where the electric utility or regional Independent System Operator (ISO) or Regional Transmission Operator (RTO) does not offer a demand response program to buildings regulated by this code.
2. Buildings with a peak electric demand not greater than ~~0.75~~ 0.80 times that of the standard reference design.
3. Buildings that have incorporated onsite renewable energy generation designed to provide 20 percent or more of the building's peak energy demand during the period of the day when the building reaches its peak demand.

604.4 Lighting. In Group B office spaces, the Auto-DR system shall be capable of reducing total connected power of lighting as determined in accordance with Section C405.5 of the *International Energy Conservation Code* by not less than ~~45~~50 percent.

Exception: The following buildings and lighting systems need not be addressed by the Auto-DR system:

1. Buildings or portions associated with lifeline services.
2. Luminaires on emergency circuits.
3. Luminaires located in emergency and life safety areas of a building.
4. Lighting in buildings that are less than 5,000 square feet (465 m²) in total area.
5. Luminaires located within a daylight zone that are dimmable and connected to automatic *daylight controls* complying with Section C405.2.2.3.2 of the *International Energy Conservation Code*.
6. Signage used for emergency, life safety or traffic control purposes.

Reason: The revised values shown in the proposed changes are designed to account for the changes that have occurred in cooling system and lighting system efficiency over the past few years.

1) For cooling systems, the efficiency of nearly all types of electric commercial cooling equipment was increased with the publication of ASHRAE 90.1-2013 and the latest version of the IECC. For equipment where the minimum efficiency was not raised at publication, the efficiency levels will be increased as of 1/1/2015 or 1/1/2016. For other types of cooling equipment that may be used, such as residential-sized central air conditioners, central heat pumps, and room air conditioners, efficiency levels will increase as of June 2014 (room air conditioners) or January 2015 (central air conditioners and heat pumps).

The percentage required has been lowered to account for the mandated efficiency increases, since they will reduce peak demand for nearly all commercial buildings.

2) In terms of renewable energy systems, suppose a building has a peak demand of 100 kW, and the renewable energy system provides 20 kW at night, and 0 kW during the day. In terms of peak demand, the renewable system is not providing any value. The proposed language provides the exception to systems that are providing energy when the energy production is coincident with the building's peak demand.

3) For lighting systems, the efficiency of the most common types of lighting equipment has increased or will be increased within the next year. The efficiency levels of general service fluorescent lamps, fluorescent lamp ballasts, general service incandescent lamps, incandescent reflector lamps, and metal halide lamp fixtures have increased significantly over the past few years, or will be increased within the next few years.

In addition, in the ASHRAE 90.1-2013 lighting section, the maximum lighting power density for office buildings under the Building Area Method has been reduced from 0.90 Watts/ft² (in the 2010 version of ASHRAE 90.1) to 0.82 Watts/ft², which corresponds to a 8.9% reduction.

The percentage required for lighting has been lowered to account for the mandated efficiency increases, since they will reduce peak demand for nearly all commercial buildings.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code sections C405.5 and C405.2.2.3.2 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Editions will be C405.4 and C405.2.3, respectively.

GEW56-14: 604.1-ROSENSTOCK547

GEW57-14

604.1

Proponent: Charles Foster, Steffes Corporation, representing self (cfoster20187@yahoo.com)

Revise as follows:

604.1 Establishing an open and interoperable automated demand-response (Auto-DR) infrastructure. Where this section is indicated to be applicable in Table 302.1, buildings that contain heating, ventilating, air-conditioning (HVAC) or lighting systems shall comply with Sections 604.1 through 604.4. A building energy management and control system (EMCS) shall be provided and integrated with building HVAC systems controls and lighting systems controls to receive an open and interoperable automated demand-response (Auto-DR) relay or Internet signal. Building HVAC and lighting systems and specific building energy-using components shall incorporate preprogrammed demand response strategies that are automated with a demand response automation Internet software client.

Exception: Auto-DR infrastructure is not required for the following:

1. Buildings located where the electric utility, gas utility, or regional Independent System Operator (ISO) or Regional Transmission Operator (RTO) does not offer a demand response program to buildings regulated by this code.
2. Buildings with a peak electric or natural gas demand not greater than 0.75 times that of the standard reference design.
3. Buildings that have incorporated onsite renewable energy generation to provide 20 percent or more of the building's peak energy demand.

Reason: Currently, Section 604 does not address gas peak reductions in buildings even though some gas companies offer DR programs to customers. Moreover, gas supply infrastructure has become more taxed as exploration has increased in the United States.

Auto DR controls can reduce fossil fuel usage as well as electric usage (e.g., lower space heating thermostats and water heating thermostats in the winter). For item 2, it prevents any gaming by fuel switching. Lowering electric demand by increasing fossil fuel demand runs counter to the goals of a green building code.

Additionally, in cases where one energy demand occurs during one season (e.g., electric demand in the summer) and another energy demand occurs during a different season (e.g., fossil fuel demand in the winter), but the values are the same or very close to each other, the revised language will ensure that the building is designed to reduce all peak energy demands, and not allow any game playing that would result from fuel switching (such as increasing one energy type of peak demand to lower another energy type of peak demand).

Cost Impact: Will not increase the cost of construction.

GEW57-14 : 604.1-FOSTER556

GEW58-14

604.1

Proponent: Meg Waltner, National Resources Defense Council, representing Natural Resources Defense Council (mwaltner@nrdc.org)

Revise as follows:

604.1 Establishing an open and interoperable automated demand-response (Auto-DR) infrastructure. Where this section is indicated to be applicable in Table 302.1, buildings that contain heating, ventilating, air-conditioning (HVAC) or lighting systems shall comply with Sections 604.1 through 604.4. A building energy management and control system (EMCS) shall be provided and integrated with building HVAC systems controls and lighting systems controls to receive an open and interoperable automated demand-response (Auto-DR) relay or Internet signal. Building HVAC and lighting systems and specific building energy-using components shall incorporate preprogrammed demand response strategies that are automated with a demand response automation Internet software client.

Exception: Auto-DR infrastructure is not required for the following:

- ~~1. Buildings located where the electric utility or regional Independent System Operator (ISO) or Regional Transmission Operator (RTO) does not offer a demand response program to buildings regulated by this code.~~
1. Buildings with a peak electric demand not greater than 0.75 times that of the standard reference design.
2. Buildings that have incorporated onsite renewable energy generation to provide 20 percent or more of the building's energy demand.

Reason: This proposal would remove the current exception to the automated demand-response infrastructure requirement for buildings located where the utility or regional Independent System Operator (ISO) or Regional Transmission Operator (RTO) do not yet offer a demand response program. Demand response is becoming an increasingly important tool to manage demand on the grid and integrate variable energy resources. Most recently, demand response played a critical role in preventing power outages during the extreme cold temperatures in January 2014. Demand response capabilities are easiest and cheapest to integrate into a building when it is first constructed and building systems and their controls are first installed. Many utilities, ISOs and RTOs already offer demand response programs and the number of programs and the need for demand response is only likely to grow going forward. Even if a demand response program does not exist at the time of construction, it is likely that one will be developed over the life of the building. Furthermore, integrating demand-response infrastructure into buildings provides a demand response resource which will facilitate the creation of demand response programs. Given the high benefits of and need for demand response, and the relative ease and low cost of integrating these capabilities at the time of construction we recommend removing the exception for buildings located in an area without a current DR program.

Cost Impact: Will increase the cost of construction.

GEW58-14:604.1 #1-WALTNER963

GEW59-14

604.3

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org); Brenda Thompson, Chair, representing the Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

604.3 Heating, ventilating and air-conditioning (HVAC) systems. The Auto-DR strategy for HVAC systems shall be capable of reducing the building peak cooling or heating HVAC demand by not less than 10 percent when signaled from the electric utility, regional independent system operator (ISO) or regional transmission operator (RTO), through any combination of the strategies and systemic adjustments, including, but not limited to the following:

1. Space temperature setpoint reset.
2. Increasing chilled water supply temperatures or decreasing hot water supply temperatures.
3. Increasing or decreasing supply air temperatures for variable air volume (VAV) systems.
4. Limiting capacity of HVAC equipment that has variable or multiple-stage capacity control.
5. Cycling of HVAC equipment or turning off noncritical equipment.
6. Disabling HVAC in unoccupied areas.
7. Limiting the capacity of chilled water, hot water, and refrigerant control valves.
8. Limiting the capacity of supply and exhaust fans, without reducing the outdoor air supply below the minimum required by Chapter 4 of the *International Mechanical Code*, or the minimum required by ASHRAE 62.1.
9. Limiting the capacity of chilled water or hot water supply pumps.
10. Anticipatory control strategies to precool or preheat in anticipation of a peak event.

Exception: The Auto-DR strategy is not required to include the following buildings and systems:

1. ~~Hospitals and~~ Group I-2 Condition 2
2. Critical emergency response facilities.
3. Life safety ventilation for hazardous materials storage.
4. Building smoke exhaust systems.
5. Manufacturing process systems.

Reason: The exception should pertain to all healthcare facilities that provide emergency and life sustaining services. The previous language does not use the standard ICC language to address hospitals and other emergency and life sustaining facilities. Using Group I-2, Condition 2 will provide the appropriate language for this exception.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW59-14: 604.3-PAARLBERG642

GEW60-14

604.4

Proponent: Glenn Heinmiller, Lam Partners, Inc, representing International Association of Lighting Designers (glenn@lampartners.com)

Revise as follows:

604.4 Lighting. In Group B office spaces, the Auto-DR system shall be capable of reducing total connected power of lighting as determined in accordance with Section C405.5 of the *International Energy Conservation Code* by not less than 15 percent.

Exception: The following buildings and lighting systems need not be addressed by the Auto-DR system:

- ~~1. Buildings or portions associated with lifeline services.~~
2. Luminaires on emergency circuits.
- ~~3. Luminaires located in emergency and life safety areas of a building.~~
4. Lighting in buildings that are less than 5,000 square feet (465 m²) in total area.
5. Luminaires connected to *daylight responsive controls* located within a daylight zone that are dimmable and connected to automatic *daylight controls* complying with Section C405.2.2.3.2 of the *International Energy Conservation Code*.
- ~~6. Signage used for emergency, life safety or traffic control purposes.~~

Reason: Exception 1 is incomprehensible. It refers to "lifeline services." Whatever this is, it is not a defined term and not a commonly used term.

Exception 3 is redundant: luminaires in "emergency and life safety areas of a building" should also be connected to emergency circuits and thus would be covered by exception 2.

Exception 5 is updated to incorporate new terminology from in the 2015 IECC which came from CE294-13 AMPC1/3.

Exception 6 is not necessary because signage is not lighting, and additionally is already exempt from the total connected power for interior lighting in IECC C405.5 (Section C405.4 of 2015 code).

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code sections C405.5 and C405.2.2.3.2 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Editions will be C405.4 and C405.2.3, respectively.

GEW60-14: 604.4-HEINMILLER592

GEW61-14

604.4

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

604.4 Lighting. In Group B office spaces, the Auto-DR system shall be capable of reducing total connected power of lighting as determined in accordance with Section C405.5 of the *International Energy Conservation Code* by not less than 15 percent.

Exception: The following buildings and lighting systems need not be addressed by the Auto-DR system:

1. ~~Buildings or portions associated with lifeline services.~~
2. Luminaires on emergency circuits.
3. Luminaires located in emergency and life safety areas of a building.
4. Lighting in buildings that are less than 5,000 square feet (465 m²) in total area.
5. Luminaires located within a daylight zone that are dimmable and connected to automatic *daylight controls* complying with Section C405.2.2.3.2 of the *International Energy Conservation Code*.
6. Signage used for emergency, life safety or traffic control purposes.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The SEHPCAC was concerned that the term 'lifeline services' was undefined and therefore unclear. As such the enforcement of this exception would be unclear. We learned that 'lifeline services' is a term of art used in disaster mitigation planning. It generally refers to the infrastructure systems which provide services to the population of an area such as water, sewer, power distribution and communications. While the committee agreed that these infrastructure systems shouldn't have power reduced via an Auto -DR system, this requirement is only for the lighting in Group B offices. There is no reason why the management offices of infrastructure systems shouldn't be included in the Auto DR system. Therefore the proposal is to eliminate the exception for office buildings associated with a lifeline service.

Cost Impact: Will increase the cost of construction. Eliminating the exception for these buildings will therefore impose the requirement and increase the cost of constructing them.

Analysis: The International Energy Conservation Code sections C405.5 and C405.2.2.3.2 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Editions will be C405.4 and C405.2.3, respectively.

GEW61-14: 604.4-THOMPSON568

GEW62-14

202 (New), 604.5 (New)

Proponent: Charles Foster, Steffes Corporation, representing Steffes Corporation
(cfoster20187@yahoo.com)

Add new definition as follows:

ENERGY STORAGE SYSTEM Equipment that are designed for and capable of receiving, storing and discharging energy. Common examples of energy storage systems include chemical batteries, flywheels, and thermal storage systems.

Add new text as follows:

604.5 Energy storage. Where an energy storage is used as a means to comply with the requirements of this section, Sections 606 or 607, the following information shall be submitted for review to the *code official*:

1. A narrative describing the operation of the energy storage system that identifies, among other things, the building end use loads being supplied by the energy storage system and the storage medium used.
2. A list of energy storage system components.
3. A calculation that shows the maximum charge level (KWh), maximum electric charge rate (KW) and electric or thermal discharge rate (KW) of the system.
4. The name of the utility, ISO, or RTO that will control the energy storage system.
5. Whether the energy storage system is to be dispatched by the serving grid operator, or micro-grid operator for frequency regulation, renewable integration, or grid stabilization purposes.
6. Other information requested by the code official.

Reason: For many years, energy storage has played an important role in the development of safe, reliable electric grids in North America. These traditional roles have included thermal energy space and water heater storage programs by electric utilities to manage power supply and demand while providing affordable – and sometimes even negative –operating costs for consumers.

More recently, however, Energy storage has taken on an even more important role as buildings move toward net-zero energy. Without cost effective energy storage, the development of grid-scale renewable energy is limited. Additionally, electric grid operators are struggling to balance the addition of renewable energy from wind and solar with their customer demands – often renewable energy production peaks when customer demand is low. Electric grid imbalances caused by the addition of renewable energy during periods of low customer demand threaten grid stability.

For these reasons and others, the U.S. Department of Energy, Federal Energy Regulatory Commission, state public service commissions, ISO's and RTO's and others are giving great attention to energy storage.

This proposal is a baby step towards merging building science with the growing need for energy storage. In effect, this proposal simply states that, if a building is to be used as an energy storage facility, there are a few details that need to be provided to the authority having jurisdiction. The requirements are minimal and are things that are well known in the energy storage community.

It is anticipated that once this section is established it will be modified with more details in future editions of the IGCC but for the moment it would serve as a placeholder for this issue of rapidly growing importance. It would also help to establish the IGCC's *bona fides* as a leader in the green building arena.

Bibliography:

See article at:
<http://www.pjm.com/about-pjm/exploring-tomorrows-grid/electricity-storage.aspx?p=1> for information on the value of ETS in the PJM Interconnection service territory.

See article at

<http://www.sustainablebusinessoregon.com/articles/2012/04/bonneville-power-calls-for-first-wind.html?page=all> for information on Bonneville Power curtailment of wind generation amounting to almost 100,000 MWH's in 2011.

See Kema Consulting report (Commissioned by the U.S. Department of Energy under the supervision of Sandia National Laboratory) noting significant reduction in carbon emissions at <http://prod.sandia.gov/techlib/access-control.cgi/2008/088229.pdf>.

See <http://www.steffes.com/off-peak-heating/ets.html> for more information on utility benefits of WTS, including energy savings associated with thermal storage and frequency regulation.

See Sandia National Laboratory website at <http://www.sandia.gov/ess/> for information on the contributions of energy storage to electric grid stability.

For a detailed description of frequency regulation in North America see Department of Energy / National Energy Technology Laboratory Report Frequency Instability Problems in North American Interconnections, DOE/NETL-2011/1473, Final Report dated May 1, 2011 found at <http://www.netl.doe.gov/energy-analyses/pubs/TransmissionFreqProb.pdf>

Cost Impact: Will not increase the cost of construction.

GEW62-14: 604.5 (NEW)-FOSTER749

GEW63-14 202 (New), 604.3

Proponent: Charles Foster, Steffes Corporation, representing Steffes Corporation
(cfoster20187@yahoo.com)

Revise as follows:

604.3 Heating, ventilating and air-conditioning (HVAC) systems. The Auto-DR strategy for HVAC systems shall be capable of reducing the building peak cooling or heating HVAC demand by not less than 10 percent when signaled from the electric utility, regional independent system operator (ISO) or regional transmission operator (RTO), through any combination of the strategies and systemic adjustments, including, but not limited to the following:

1. Space temperature setpoint reset.
2. Increasing chilled water supply temperatures or decreasing hot water supply temperatures.
3. Increasing or decreasing supply air temperatures for variable air volume (VAV) systems.
4. Limiting capacity of HVAC equipment that has variable or multiple-stage capacity control.
5. Cycling of HVAC equipment or turning off noncritical equipment.
6. Disabling HVAC in unoccupied areas.
7. Limiting the capacity of chilled water, hot water, and refrigerant control valves.
8. Limiting the capacity of supply and exhaust fans, without reducing the outdoor air supply below the minimum required by Chapter 4 of the *International Mechanical Code*, or the minimum required by ASHRAE 62.1.
9. Limiting the capacity of chilled water or hot water supply pumps.
10. Anticipatory control strategies to precool or preheat in anticipation of a peak event.
11. Use of grid-interactive electric thermal storage (GETS) systems.

Exception: The Auto-DR strategy is not required to include the following buildings and systems:

1. Hospitals and critical emergency response facilities.
2. Life safety ventilation for hazardous materials storage.
3. Building smoke exhaust systems.
4. Manufacturing process systems.

Revise definition as follows:

DEMAND RESPONSE (DR). The ability of a building system to ~~reduce~~change the building's energy consumption for a specified time period after receipt of demand response signal typically from the power company or demand response provider. Signals requesting demand response are activated at times of peak usage or when power reliability is at risk.

DEMAND RESPONSE AUTOMATION SOFTWARE. Software that resides in a energy management control systems or equipment that can receive a demand response signal and automatically ~~reduce~~change space heating, ventilation, air-conditioning (HVAC), service water heating and lighting system loads.

GRID-INTERACTIVE ELECTRIC THERMAL STORAGE (GETS). An electric-powered heat storage system for space heating units and service water heating units that is controlled by electric system grid operators such as utilities, independent system operators (ISOs) and regional transmission organizations (RTOs).

Reason: While not imposing any additional mandatory requirements, this proposal would add Grid-Interactive Electric Thermal Storage as one of the specifically identified means of meeting the requisites of the Demand Response section of Chapter 6. Section 601.2 of the IGCC states, "[t]his chapter is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve the effective use of energy."

Grid-Interactive Electric Thermal Storage is such an innovative approach with a growing reputation among market participants as a solution to some of today's most pressing energy issues.

1. Building owners like GETS because it provides affordable and dependable space and service water heating for their structures.
2. Electric grid operators like GETS because it helps them balance energy supply and demand in real time, thereby increasing grid stability while simultaneously reducing costs, energy and emissions. Maintaining grid stability becomes more challenging as the output of renewable energy generation (like wind and solar) is added to electric grids which explains why grid operators across the country (as well as the Federal Energy Regulatory Commission and the U.S. Department of Energy) have expressed their support for energy storage.
3. Renewable energy developers like GETS because it complements their projects by providing cost-effective energy storage when renewable energy production exceeds demand. Without adequate energy storage, these projects are often curtailed.

What is a Grid-Interactive Electric Thermal System ("GETS")?

For building owners and operators, GETS serve as traditional space and service water heating systems. GETS provide affordable and dependable space conditioning and domestic hot water. Nonetheless, GETS have significantly different operational and energy consumption characteristics from traditional space and service water heating systems as described in more detail below.

Thermal battery. Electric utilities dispatch their generators in the order from the most cost efficient (base load generation) to the least cost efficient (peaking load generation). GETS complements the efficient dispatch of generation by utilities by allowing the storage of energy that is produced more efficiently for use later, and by avoiding the requirement to operate less efficient generators at peak load conditions. GETS accomplishes this feat by charging (heating bricks, water, or other storage media) at times when utilities have excess capacity. Often this is at night but it can vary between utilities. Because the system is grid-interactive, a GETS can charge at times that are optimum for the utility, allowing utilities to efficiently manage their peak demands and their customer costs. Heat that is stored for later use effectively makes GETS a thermal battery.

Renewable energy. GETS is a unique complement to the generation of electricity from renewable energy like wind and solar. Many times peak power production from renewable energy sources does not coincide with a utility's demand for electricity. As an example, wind generation usually peaks at night when demand for energy is not usually the greatest. For that reason, Bonneville Power last year was forced to curtail the generation from wind generators at certain times because it didn't need all the electricity the wind generators were producing! GETS is a good fit for storing excess renewable energy and has been successfully deployed in Bonneville's service territory as well as the service territory of other electric utilities.

Reduces winter peak. When electrical demands on a utility's system grow, it is forced to dispatch less efficient generators to meet that demand, so to the extent demand is reduced the utility avoids costs (that would ultimately be passed on to customers) and saves energy. GETS allows the storage of energy produced by more efficient generators.

Replaces fossil fuel in utility grid control. When electrical demand on a utility's grid changes (up or down), the most immediate system response is for the grid's frequency to drift away from ideal (60 cycles per second). To control these frequency excursions, utilities have traditionally operated fossil fuel generators to add voltage to the grid to raise the frequency as it falls away from

60 cycles. Grid-interactive GETS can be dispatched in lieu of fossil fuel generators to remedy frequency excursions, thereby saving energy and costs. According to a Kema report, usage of a non-carbon emitting resource such as GETS for providing regulation services can reduce carbon emissions for regulation by nearly 65%.

GETS offer significant benefits to customers, including the ability to store renewable energy, the ability to reduce utility costs, and the ability to reduce the consumption of fossil fuel by utilities in the regulation of system frequency.

Bibliography:

See article at <http://www.pjm.com/about-pjm/exploring-tomorrows-grid/electricity-storage.aspx?p=1> for information on the value of ETS in the PJM Interconnection service territory.

See article at <http://www.sustainablebusinessoregon.com/articles/2012/04/bonneville-power-calls-for-first-wind.html?page=all> for information on Bonneville Power curtailment of wind generation amounting to almost 100,000 MWH's in 2011.

See Kema Consulting report (Commissioned by the U.S. Department of Energy under the supervision of Sandia National Laboratory) noting significant reduction in carbon emissions at <http://prod.sandia.gov/techlib/access-control.cgi/2008/088229.pdf>.

See <http://www.steffes.com/off-peak-heating/ets.html> for more information on utility benefits of WTS, including energy savings associated with thermal storage and frequency regulation.

See Sandia National Laboratory website at <http://www.sandia.gov/ess/> for information on the contributions of energy storage to electric grid stability.

For a detailed description of frequency regulation in North America see Department of Energy / National Energy Technology Laboratory Report Frequency Instability Problems in North American Interconnections, DOE/NETL-2011/1473, Final Report dated May 1, 2011 found at <http://www.netl.doe.gov/energy-analyses/pubs/TransmissionFreqProb.pdf>

Cost Impact: Will not increase the cost of construction.

GEW63-14: 604.5-FOSTER731

GEW64-14

605.1.1

Proponent: Jay Johnson, Thomas Associates, Inc., representing Metal Building Manufacturers Association (jjohnson@thomasamc.com)

Delete without substitution:

~~**605.1.1 Insulation and fenestration criteria.** The *building thermal envelope* shall exceed the requirements of Tables C402.1.2 and C402.3 of the *International Energy Conservation Code* by not less than 10 percent. Specifically, for purposes of compliance with this code, each U-factor, C-factor, F-factor and SHGC in the specified tables shall be reduced by 10 percent to determine the prescriptive criteria for this code. In Sky Type "C" locations specified in Section 808.4, the skylights shall not exceed 5 percent of the building roof area.~~

Reason: The across-the-board reduction of U-factors by 10% described in this section is an over-simplified approach that has no guarantee of achieving a significant reduction in energy use as intended. Reducing U-factors obviously does mitigate external heat gains and losses; however, in certain mild climates or in occupancies that require high ventilation rates, such as retail or institutional occupancies, it would have only a minor effect.

Furthermore, an arbitrary reduction of U-factors can greatly affect the type of insulation system chosen as it may not always be possible to find a system with the required U-factor and therefore the designer must choose the next lowest U-factor and may be pushed into a different type of system altogether. This compounds the problem stated above.

A designer would typically refer to the IECC Table C402.1.2 for the Opaque Thermal Envelope Assembly Requirements for U-factors, C-factors, and F-factors, then determine the equivalent R-value assembly via the IECC Table 402.2. This simplifies the building official's review process by having both tables on hand within the IECC. By decreasing the factors by 10% now removes the use of the prescriptive R-value based IECC Table 402.2. An alternative, per footnote "a" would be to refer to ASHRAE 90.1 Appendix A for applicable assemblies to meet the reduction in factors. As a result, the building official would likely want to have on hand the ASHRAE 90.1 standard during the plan review process. As stated above, often times there is not a tested assembly that is close to the 10% reduced factor, as a result a more costly system may be required.

Cost Impact: Will not increase the cost of construction.

GEW64-14: 605.1.1-JOHNSON928

GEW65-14

605.1.1

Proponent: Larry Williams, Steel Framing Association, representing Steel Framing Industry Association (Williams@steelframingassociation.org)

Revise as follows:

605.1.1 Insulation and fenestration criteria. In climate zones 1, 2, 3, 4 and 5, the thermal resistance of the building thermal envelope shall be not less than ~~exceed~~ the requirements of Tables C402.1.2 and C402.3 of the International Energy Conservation Code ~~by not less than 10 percent.~~ ~~Specifically, for purposes of compliance with this code,~~ In climate zones 6, 7, and 8, each U-factor, C-factor, F-factor and SHGC in the specified Tables C402.1.2 and C402.3 of the *International Energy Conservation Code* shall be reduced by 10 percent to determine the prescriptive criteria for this code. In Sky Type 'C' locations specified in Section 808.4, the skylights shall not exceed 5 percent of the roof area.

Reason: This proposal will reduce the application of an arbitrary U-factor reduction across the board to all climate zones despite the benefits of further decreases in envelope requirements being insignificant in the warmer climate zones.

A 10% U-factor decrease is not the same as a 10% increase in performance. It is discriminatory against some building materials due to the different U factors in the base IECC code. This creates a different "green standard" for performance for some materials versus others. The 10% is more stringent for those materials with higher U-factors in the IECC. This unlevel playing field is mitigated somewhat by applying the 10% only to the colder climate zones where the potential energy savings, although still small, is not as insignificant as in the warmer climate zones.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code tables C402.1.2 and C402.3 referenced in the text of this proposal are numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the table numbers for the 2015 Editions will be C402.1.4 and C402.4, respectively.

GEW65-14: 605.1.1-WILLIAMS634

GEW66-14

605.1.1

Proponent: Paul Coats, American Wood Council, representing American Wood Council
(pcoats@awc.org)

Revise as follows:

605.1.1 Insulation and fenestration criteria. The building thermal envelope shall exceed the requirements of Tables C402.1.2 and C402.3 of the *International Energy Conservation Code* by not less than 40 5 percent. Specifically, for purposes of compliance with this code, each U-factor, C-factor, F-factor and SHGC in the specified tables shall be reduced by 40 5 percent to determine the prescriptive criteria for this code. In Sky Type "C" locations specified in Section 808.4, the skylights shall not exceed 5 percent of the building roof area.

Reason: A five percent increase of the IECC, which could itself be considered green, could be considered sufficient and may lead to better use of the IgCC, and the other benefits it provides. Although an official DOE determination has not been issued, it is anticipated that the 2012 IECC improves on the previous edition of that code. The percent of building envelope improvement required by the IgCC should be adjusted to recognize this. If five percent is determined to not be the correct number, at least this proposal provides an opportunity for adjustment.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code tables C402.1.2 and C402.3 referenced in the text of this proposal are numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the table numbers for the 2015 Editions will be C402.1.4 and C402.4, respectively.

GEW66-14: 605.1.1-COATS755

GEW67-14

605.1.1

Proponent: Martha VanGeem, Consulting Engineer, representing self (martha.vangeem@gmail.com)

Revise as follows:

605.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall exceed the requirements of Tables C402.1.2 and C402.3 of the *International Energy Conservation Code* by not less than 10 percent. Specifically, for purposes of compliance with this code, each U-factor, C-factor, F-factor and SHGC in the specified tables shall be reduced by 10 percent to determine the prescriptive criteria for this code. Where Table C402.2 of the *International Energy Code* provides for no requirement (NR) for the R-value of an assembly, the U-factor is not required to be reduced. In Sky Type “C” locations specified in Section 808.4, the skylights shall not exceed 5 percent of the building roof area.

Reason: This modification is needed for assemblies that do not require insulation in the IECC. For warm climates, the unheated slab-on-grade, floor, and below grade wall R-value is designated “NR” (no requirement) in the IECC. No insulation is required for these assemblies. However, a U-factor is provided for use in trade-off paths. In these cases, reducing the U-factor by 10% would mean adding a sliver of insulation. This would not be cost effective since applying the first level of insulation has a significant cost. Insulating slabs in these warm climates is problematic for termite inspection. Adding insulation below grade is not cost-effective in these warm climates because it negates the cooling effect of the ground in these climates. Adding insulation below floors in these warm climates is not cost-effective and is often the cause of moisture problems.

Cost Impact: Will not increase the cost of construction

Analysis: The International Energy Conservation Code tables C402.1.2, C402.3 and C402.2 referenced in the text of this proposal are numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the table numbers for the 2015 Editions will be C402.1.4, C402.4 and C402.1.3, respectively.

GEW67-14: 605.1.1-VANGHEEM889

GEW68-14

605.1.1.1

Proponent: Eric DeVito, BBR&S representing Cardinal Glass Industries, representing Brickfield, Burchette, Ritts & Stone (eric.devito@bbrslaw.com)

Delete without substitution:

~~**605.1.1.1 Permanent shading devices for fenestration.** Vertical fenestration within 45 degrees (785 rad) of the nearest west, south, and east cardinal ordinate shall be shaded by permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.~~

~~**Exception:** Shading devices are not required for the following buildings and fenestrations:~~

- ~~1. Buildings located in hurricane-prone regions in accordance with Section 1609.2 of the *International Building Code* or on any other building with a mean roof height exceeding the height limits specified in Table 1504.8 of the *International Building Code* based on the exposure category and basic wind speed at the building site.~~
- ~~2. Where fenestration is located in a building wall that is within 18 inches (457 mm) of the lot line.~~
- ~~3. Where equivalent shading of the fenestration is provided by buildings, structures, geological formations, or permanent exterior projections that are not horizontal, as determined by sun angle studies at the peak solar altitude on the spring equinox, and three hours before and after the peak solar altitude on the spring equinox.~~
- ~~4. Where fenestration contains dynamic glazing that has a lower labeled solar heat gain coefficient (SHGC) equal to or less than 0.12, and the ratio of the higher and lower labeled visible transmittance (VT) is greater than or equal to 5. Dynamic glazing shall be automatically controlled to modulate, in multiple steps, the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity. Functional testing of controls shall be conducted in accordance with Section C408.3.1 of the *International Energy Conservation Code*.~~

Reason: As it is currently written, the IgCC prescriptive shading option unnecessarily complicates what otherwise would be a very straightforward and simple-to-apply prescriptive compliance option based on a reasonable level of improvement over the IECC. The shading language alone is roughly double the length of the entire remainder of the IgCC's prescriptive building envelope systems compliance path (Section 605). Moreover, while there is no shading requirement in the IECC at all, this section of the IgCC singles out shading as the single new "energy efficiency" requirement for the thermal envelope under the prescriptive path. Deleting Section 605.1.1.1 will make the code more flexible and more usable without decreasing efficiency or sustainability. Although shading devices can be effective at reducing direct solar radiation in some circumstances, they are not appropriate or cost-effective for every building and every circumstance. The exceptions in the current code simply are not possible in many projects. Requiring permanent shading devices in nearly every building is too design-restrictive, and it makes the prescriptive compliance option very difficult or impossible to use. With the availability of low SHGC glazing, the need for permanent shading does not exist in many buildings and orientations.

The elimination of this prescriptive requirement will not weaken the code. Permanent shading devices are already incorporated as options into the prescriptive and performance options of the IECC, which recognizes that permanent shading devices are but one option to control SHGC. (The predominant method under the IECC is low SHGC glazing.) In fact, eliminating the prescriptive requirement from IgCC Section 605.1.1.1 eliminates the potential for "double-counting" permanent shading devices in the calculation of energy conservation measures (since the IECC permits higher SHGCs where permanent shading devices meet certain projection factors). Shading devices would remain one of several options for achieving a 10% improvement over the IECC per Section 605.1.1, instead of a near-mandatory requirement in itself.

Cost Impact: Will not increase the cost of construction. Deleting this section likely will decrease the cost of construction.

GEW68-14: 605.1.1.1-DEVITO833

GEW69-14

605.1.1.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

605.1.1.1 Permanent shading devices for fenestration. Vertical fenestration within ~~45~~ ¹³⁵ degrees (~~785~~ ³³¹⁶ rad) of the nearest ~~west, south, and east~~ cardinal ordinate in buildings located in the northern hemisphere, or the nearest north cardinal ordinate in buildings located in the southern hemisphere, shall be shaded by permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.

Exception: Shading devices are not required for the following buildings and fenestrations:

1. Buildings located in hurricane-prone regions in accordance with Section 1609.2 of the *International Building Code* or on any other building with a mean roof height exceeding the height limits specified in Table 1504.8 of the *International Building Code* based on the exposure category and basic wind speed at the building site.
2. Where fenestration is located in a building wall that is within 18 inches (457 mm) of the lot line.
3. Where equivalent shading of the fenestration is provided by buildings, structures, geological formations, or permanent exterior projections that are not horizontal, as determined by sun angle studies at the peak solar altitude on the spring equinox, and three hours before and after the peak solar altitude on the spring equinox.
4. Where fenestration contains dynamic glazing that has a lower labeled solar heat gain coefficient (SHGC) equal to or less than 0.12, and the ratio of the higher and lower labeled visible transmittance (VT) is greater than or equal to 5. Dynamic glazing shall be automatically controlled to modulate, in multiple steps, the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity. Functional testing of controls shall be conducted in accordance with Section C408.3.1 of the *International Energy Conservation Code*.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

This proposal revises the language so that it addresses buildings outside of the U.S., including those in the southern hemisphere and near the equator. Note that there is essentially no difference between north and south in terms of the sun when standing at the equator.

Cost Impact: Will not increase the cost of construction. The proposal is intended to be editorial, clarifying application in other than northern hemisphere.

GEW69-14: 605.1.1.1#1-THOMPSON569

GEW70-14

605.1.1.1

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Brickfield, Burchette, Ritts & Stone (gas@bbrslaw.com); Brian Dean (Brian.Dean@icfi.com); William Prindle (william.prindle@icfi.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello (misuriello@verizon.net)

Revise as follows:

605.1.1.1 Permanent shading devices for fenestration. Vertical fenestration within 45 degrees (785 rad) of the nearest west, south, and east cardinal ordinate shall be shaded by permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.

Exception: Shading devices are not required for the following buildings and fenestrations:

1. Buildings located in hurricane-prone regions in accordance with Section 1609.2 of the *International Building Code* or on any other building with a mean roof height exceeding the height limits specified in Table 1504.8 of the *International Building Code* based on the exposure category and basic wind speed at the building site.
2. Where fenestration is located in a building wall that is within 18 inches (457 mm) of the lot line.
3. Where equivalent shading of the fenestration is provided by buildings, structures, geological formations, or permanent exterior projections that are not horizontal, as determined by sun angle studies at the peak solar altitude on the spring equinox, and three hours before and after the peak solar altitude on the spring equinox.
4. Where fenestration has an solar heat gain coefficient (SHGC) equal to or less than 0.25.
4. 5. Where fenestration contains dynamic glazing that has a lower labeled solar heat gain coefficient (SHGC) equal to or less than 0.12, and the ratio of the higher and lower labeled visible transmittance (VT) is greater than or equal to 5. Dynamic glazing shall be automatically controlled to modulate, in multiple steps, the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity. Functional testing of controls shall be conducted in accordance with Section C408.3.1 of the *International Energy Conservation Code*.

Reason: This proposal adds an efficient, practical, cost-effective and commercially-available exception to the current IgCC prescriptive requirement for permanent shading devices. The IgCC must have a simple set of prescriptive requirements for energy conservation measures. These requirements must be applicable to a wide range of climate zones and applications in order to ensure the usefulness and effectiveness of the IgCC. However, there must be enough flexibility to accommodate a wide range of design decisions and local constraints. The current prescriptive path applies a permanent shading requirement to every building unless one of four exceptions applies. These exceptions are extremely narrow, and as a result make the prescriptive compliance option very costly and difficult to use.

The new exception proposed above offers a very practical method for maintaining control of solar heat gain, which is the intended purpose of 605.1.1.1. It will also expand the potential options available to code users, and in turn could expand the ability to use the IgCC prescriptive envelope path when otherwise warranted. The new exception would permit code users to comply by installing fenestration that achieves a maximum of 0.25 SHGC. This change makes sense for a number of reasons:

Low-SHGC windows have consistently proven valuable in commercial construction because of typical daytime occupancy patterns and high internal loads. Low-SHGC windows reduce the impact of both direct and indirect solar radiation, regardless of orientation.

The 0.25 SHGC value is achieved by commonly available glazing technologies in all frame types. It is commercially available today around the country. In fact, the IECC has required a 0.25 SHGC in climate zones 1-3 since the 2006 edition. Although the SHGC can be increased under the IECC when the user utilizes the projection factor trade-off, some level of control over solar heat gain is still required in most climate zones, even in windows covered by overhangs.

Wherever permanent shading devices or one of the current exceptions is appropriate, code users will still be able to employ one of these options. However, for code users who are constrained by site planning, geography, safety issues, or economics, an exception for low-SHGC windows will provide necessary flexibility while maintaining energy savings.

Cost Impact: Will not increase the cost of construction.

GEW70-14: 605.1.1.1-STONE911

GEW71-14

605.1.1.1

Proponent: Barry Greive, Target Corporation, representing Target Corporation
(barry.greive@target.com)

Revise as follows:

605.1.1.1 Permanent shading devices for fenestration. Vertical fenestration within 45 degrees (785 rad) of the nearest west, south, and east cardinal ordinate shall be shaded by permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.

Exception: Shading devices are not required for the following buildings and fenestrations:

1. Buildings located in hurricane-prone regions in accordance with Section 1609.2 of the *International Building Code* or on any other building with a mean roof height exceeding the height limits specified in Table 1504.8 of the *International Building Code* based on the exposure category and basic wind speed at the building site.
2. Where fenestration is located in a building wall that is within 18 inches (457 mm) of the lot line.
3. Where equivalent shading of the fenestration is provided by buildings, structures, geological formations, or permanent exterior projections that are not horizontal, as determined by sun angle studies at the peak solar altitude on the spring equinox, and three hours before and after the peak solar altitude on the spring equinox.
4. Where fenestration contains dynamic glazing that has a lower labeled solar heat gain coefficient (SHGC) equal to or less than 0.12, and the ratio of the higher and lower labeled visible transmittance (VT) is greater than or equal to 5. Dynamic glazing shall be automatically controlled to modulate, in multiple steps, the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity. Functional testing of controls shall be conducted in accordance with Section C408.3.1 of the *International Energy Conservation Code*.
5. Fenestration used to enclose a vestibule.

Reason: Many buildings are required to have a vestibule and should be exempt from the shading requirement since there is a buffer already established. The vestibule area is different than other vertical fenestration, any heat gain in these areas will not have an effect on the building and vestibules are already regulated by other regulations.

Cost Impact: Will not increase the cost of construction.

GEW71-14: 605.1.1.1-GREIVE1106

GEW72-14

605.1.1.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

605.1.1.1 Permanent Shading devices for fenestration. Vertical fenestration within 45 degrees (785 rad) of the nearest west, south, and east cardinal ordinate shall be shaded by one or a combination of the following methods:

1. Permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.
2. Automatically controlled shading devices capable of modulating in multiple steps the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity, that comply with all of the following:
 - 2.1. Exterior shading devices in the closed position shall cover not less than 90 percent of the fenestration.
 - 2.2. Interior shading devices in the closed position shall cover not less than 90 percent of the fenestration and have a minimum solar reflectance of 0.50 for the surface facing the fenestration.
 - 2.3. A manual override, where provided, shall override operation of automatic controls no longer than 4 hours.
 - 2.4. Commissioning shall be conducted as required by Section 611.4 to verify automatic controls for shading devices respond to changes in illumination or radiation intensity.

Exception: Shading devices are not required for the following buildings and fenestrations:

1. Buildings located in hurricane-prone regions in accordance with Section 1609.2 of the *International Building Code* or on any other building with a mean roof height exceeding the height limits specified in Table 1504.8 of the *International Building Code* based on the exposure category and basic wind speed at the building site.
2. Where fenestration is located in a building wall that is within 18 inches (457 mm) of the lot line.
3. Where equivalent shading of the fenestration is provided by buildings, structures, geological formations, or permanent exterior projections that are not horizontal, as determined by sun angle studies at the peak solar altitude on the spring equinox, and three hours before and after the peak solar altitude on the spring equinox.
4. Where fenestration contains dynamic glazing that has a lower labeled solar heat gain coefficient (SHGC) equal to or less than 0.12, and the ratio of the higher and lower labeled visible transmittance (VT) is greater than or equal to 5. Dynamic glazing shall be automatically controlled to modulate, in multiple steps, the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity. ~~Functional testing of the controls shall be of the dynamic glazing shall be conducted in accordance with Section 611.4, C408.3.4 of the *International Energy Conservation Code*.~~

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

This proposal adds automated shading systems (i.e. automatic window shading) as an alternative compliance option to fixed overhangs or louvers because they can save equal or more energy than the fixed overhangs. This is consistent with similar requirements in ASHRAE 189.1-2011 section 7.4.2.5 Permanent Projections.

Following is a summary of the advantages of automated shading systems vs. fixed overhangs taken from Lawrence Berkeley National Lab (LBNL). The full LBNL paper is attached separately.

1. Overhangs cannot be controlled once the design is complete and the system installed.
2. Overhangs will behave the same way in September as in March but March is typically still a heating season month whereas September is often still a severe cooling season month. Active dynamic glazing and shading systems can be operated to address these seasonal variations.
3. Dynamic systems (glazing/shading) can be operated to reject diffuse sky radiation as well as direct radiation.
4. Overhangs reduce useful daylight contributions when they should not, e.g. on overcast days, and during hours when the window is not in sunlight. Dynamic glazing and shading can be managed to be more transmissive when needed in order to admit daylight to reduce building lighting loads.

Cost Impact: Will increase the cost of construction. The proposal provides another option to provide shading for the glazing. The shutter systems may be more costly to install than other systems.

GEW72-14: 605.1.1.1#2-THOMPSON578

GEW73-14

605.1.1.1, 605.1.1.1.1 (New), 605.1.1.1.2 (New)

Proponent: Steven Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), representing American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) (sferguson@ashrae.org)

Revise as follows:

605.1.1.1 Permanent shading devices for fenestration. Vertical fenestration within 45 degrees (785 rad) of the nearest west, south, and east cardinal ordinate shall be shaded in accordance with Section 605.1.1.1 or 605.1.1.2 by permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.

Exceptions: Shading devices are not required for the following buildings and fenestrations:

1. Buildings located in hurricane-prone regions in accordance with Section 1609.2 of the *International Building Code* or on any other building with a mean roof height exceeding the height limits specified in Table 1504.8 of the *International Building Code* based on the exposure category and basic wind speed at the building site.
2. Where fenestration is located in a building wall that is within 18 inches (457 mm) of the lot line.
3. Where equivalent shading of the fenestration is provided by buildings, structures, geological formations, or permanent exterior projections that are not horizontal, as determined by sun angle studies at the peak solar altitude on the spring equinox, and three hours before and after the peak solar altitude on the spring equinox.
4. Where fenestration contains dynamic glazing that has a lower labeled solar heat gain coefficient (SHGC) equal to or less than 0.12, and the ratio of the higher and lower labeled visible transmittance (VT) is greater than or equal to 5. Dynamic glazing shall be automatically controlled to modulate, in multiple steps, the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity. ~~Functional testing Commissioning of controls shall~~ the dynamic glazing shall be conducted in accordance with Section ~~C408.3.4 611.4.~~ of the *International Energy Conservation Code*.

605.1.1.1.1 Fixed shading devices for fenestration. Shading shall be provided by permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.

605.1.1.1.2 Automatic shading devices for fenestration. Shading shall be provided by automatically controlled exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Shading devices for fenestration shall be provided with automatic controls that comply with all of the following:

1. Shading devices shall be capable of modulating in multiple steps the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity

2. Exterior shading devices in the closed position shall cover not less than 90 percent of the fenestration.
3. Interior shading devices in the closed position shall cover not less than 90 percent of the fenestration and shall have a minimum solar reflectance of 0.50 for the surface facing the fenestration.
4. Any manual override located in the same enclosed space as the vertical fenestration shall override operation of automatic controls no longer than 4 hours.
5. Commissioning for automatic controls for shading devices shall be conducted in accordance with Section 611.4.

Reason: This proposal adds automated shading systems (i.e. automatic window shading) as alternative compliance option instead of fixed overhangs or louvers because they can save equal or more energy than the fixed overhangs. This is consistent with similar requirements in ASHRAE 189.1-2011 sections 7.4.2.5 Permanent Projections and 8.4.1.2 Office Space Shading.

Below is summary of the advantages of automated shading systems vs. fixed overhangs taken from Lawrence Berkeley National Lab (LBNL). The full LBNL paper is attached separately.

1. Overhangs cannot be controlled once the design is complete and the system installed.
2. Overhangs will behave the same way in September as in March but March is typically still a heating season month whereas September is often still a severe cooling season month. Active dynamic glazing and shading systems can be operated to address these seasonal variations.
3. Dynamic systems (glazing/shading) can be operated to reject diffuse sky radiation as well as direct radiation.
4. Overhangs reduce useful daylight contributions when they should not, e.g. on overcast days, and during hours when the window is not in sunlight. Dynamic glazing and shading can be managed to be more transmissive when needed in order to admit daylight to reduce building lighting loads.

The first couple of changes are simply clarifications and corrections. The change to exception 4 properly refers to the commissioning of "dynamic glazing" not "functional testing of lighting controls". The appropriate section is for dynamic glazing commissioning is 611.4 Building Envelope Systems Commissioning and Completion Requirements.

In addition, this proposal splits the requirements for fixed projections and projections that are automatically controlled (but not necessarily fixed). A designer will have the option to use either for compliance.

Cost Impact: Will not increase the cost of construction. This will not increase the cost of construction as it allows an additional compliance option for fenestration shading.

GEW73-14: 605.1.1.1.1(NEW)-FERGUSON1045

GEW74-14

605.1.1.1

Proponent: Marilyn Williams, National Electrical Manufacturers Association, representing NEMA (mar_williams@nema.org)

Revise as follows:

605.1.1.1 Permanent shading devices for fenestration. Vertical fenestration within 45 degrees (785 rad) of the nearest west, south, and east cardinal ordinate shall be shaded by permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.

Exceptions: ~~Shading devices are not required for the following buildings and fenestrations:~~

1. Buildings located in hurricane-prone regions in accordance with Section 1609.2 of the *International Building Code* or on any other building with a mean roof height exceeding the height limits specified in Table 1504.8 of the *International Building Code* based on the exposure category and basic wind speed at the building site.
2. Where fenestration is located in a building wall that is within 18 inches (457 mm) of the lot line.
3. Where equivalent shading of the fenestration is provided by buildings, structures, geological formations, or permanent exterior projections that are not horizontal, as determined by sun angle studies at the peak solar altitude on the spring equinox, and three hours before and after the peak solar altitude on the spring equinox.
4. Where fenestration contains dynamic glazing that has a lower labeled solar heat gain coefficient (SHGC) equal to or less than 0.12, and the ratio of the higher and lower labeled visible transmittance (VT) is greater than or equal to 5. Dynamic glazing shall be automatically controlled to modulate, in multiple steps, the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity. ~~Functional testing~~ Commissioning of controls shall be conducted in accordance with Section 608.3.4 of the *International Energy Conservation Code*.
5. Fenestration with automatically controlled shading devices capable of modulating in multiple steps the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity, that comply with all of the following:
 - 5.1. Exterior shading devices in the closed position shall cover not less than 90 percent of the fenestration.
 - 5.2. Interior shading devices in the closed position shall cover not less than 90 percent of the fenestration, and have a minimum solar reflectance of 0.50 for the surface facing the fenestration.
 - 5.3. Any manual override located in the same enclosed space as the vertical fenestration shall override operation of automatic controls no longer than 4 hours.
 - 5.4. Commissioning shall be conducted as required by Section 611.4 to verify automatic controls for shading devices respond to changes in illumination or radiation intensity.

Reason: This proposal adds automated shading systems (i.e. automatic window shading) as alternative compliance option instead of fixed overhangs or louvers because they can save equal or more energy than the fixed overhangs. This is consistent with similar requirements in ASHRAE 189.1-2011 sections 7.4.2.5 Permanent Projections and 8.4.1.2 Office Space Shading.

Below is summary of the advantages of automated shading systems vs. fixed overhangs taken from Lawrence Berkeley National Lab (LBNL). The full LBNL paper is attached separately.

1. Overhangs cannot be controlled once the design is complete and the system installed.
2. Overhangs will behave the same way in September as in March but March is typically still a heating season month whereas September is often still a severe cooling season month. Active dynamic glazing and shading systems can be operated to address these seasonal variations.
3. Dynamic systems (glazing/shading) can be operated to reject diffuse sky radiation as well as direct radiation.
4. Overhangs reduce useful daylight contributions when they should not, e.g. on overcast days, and during hours when the window is not in sunlight. Dynamic glazing and shading can be managed to be more transmissive when needed in order to admit daylight to reduce building lighting loads.

The first couple of changes are simply clarifications and corrections. We suggest removing the sentence that says "Shading devices are not required for the following buildings and fenestrations" as it is not needed and can cause confusion with the new additional proposed language. The second change properly refers to the commissioning of "dynamic glazing" not "functional testing of lighting controls". The appropriate section is for dynamic glazing commissioning is 611.4 Building Envelope Systems Commissioning and Completion Requirements.

Cost Impact: Will not increase the cost of construction. There is no cost impact. Automatic window shades typically provide a lower cost alternative to the existing requirement of permanent projections, such as overhangs, or dynamic glazing.

GEW74-14: 605.1.1.1-WILLIAMS1039

GEW75-14

605.1.1.1 (New)

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

Add new text as follows:

605.1.1.1 Fenestration limitations. Where buildings comply with Section C402.3 of the *International Energy Conservation Code*, the total area of vertical fenestration, other than opaque doors and opaque spandrel panels, shall not be greater than 20 percent of the gross area of the above grade walls.

Reason: Unless a building is designed for daylighting, the prescriptive requirements for vertical fenestration limit the area to 30% of the gross above-grade wall area. This change proposal limits this area to 20%.

While a 10% minimum improvement over the IECC prescriptive criteria is arguably 'better' on paper, in reality it translates to little meaningful improvement to the thermal efficiency of the opaque wall surface. If meaningful improvements are desired, apply them where they will accomplish the most return. Note this change only impacts the application of the prescriptive energy efficiency requirements.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code section C402.3 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Edition will be C402.4.

GEW75-14: 605.1.1.1(NEW)-THOMPSON879

GEW76-14

605.1.1.2 (New), Chapter 12

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

605.1.1.2 Maximum exterior building envelope heat transfer. The building thermal envelope shall have an average U-factor not greater than 0.20 Btu/hr-sf-°F. The average U-factor shall be calculated by averaging the U-factor of each included envelope component in accordance with Equation 6-xx:

Average U-factor = $U_{\text{ref}}/A_{\text{total}} = (UA_1 + UA_2 + \dots + UA_n) / A_{\text{total}}$ (Equation 6-xx)

In determining the average U-factor, the following shall apply:

1. The envelope shall include all above grade walls separating conditioned from non- conditioned space or from low energy spaces.
2. The roof shall be excluded from the determination.
3. Skylight area of the roof that exceeds that allowed by prescriptive compliance under this code shall be included in the determination.
4. $U_x A_x$ is the U-factor for each individual thermal envelope component multiplied by the total area of such component incorporated in the building thermal envelope.
5. A_{total} is the total area of the included elements of the thermal building envelope as described in this section.
6. The U-factor of a penetration of mechanical equipment through the building thermal envelope, where thermal performance data are not available, shall be assumed to be 0.5 Btu/hr-sf-°F.
7. The U-factor for each component shall be calculated by taking into account thermal bridging at metal studs and members, shelf angles, floor edges, projecting balconies, window frames, and other components passing through the thermal barrier. U-factors shall be determined using test results as required by this code, tabulations provided by this code, the methods of NFRC-100, or two-dimensional heat flow modeling or three- dimensional heat flow modeling.
8. Exposed slab edges shall be considered mass walls with a horizontal dimension equal to the horizontal dimension of the thicker of the adjacent exterior walls.

Add new standard as follows:

NFRC

100-2010 Procedure for Determining Fenestration Product U-Factors

Reason: Building envelope design has a major impact on both heat loss in winter and solar gain in summer. Using the flexibility in current energy codes, designers can meet energy- efficiency requirements by trading off the efficiency of mechanical and lighting equipment against the thermal integrity of the envelope. Since the building envelope will be in use for decades or more, this trade-off is short-sighted. By establishing fixed performance requirements for building envelopes which include real-world effects of exposed slab edges and mechanical wall penetrations with respect to heat loss, independent of mechanical and lighting equipment choices, the long-lived building envelope will at least meet certain minimum standard.

The NFRC 100 standard is already referenced in the 2012 IECC.

Bibliography:

Urban Green Council, Green Codes Task Force, Energy Fundamentals Proposal 3 ([Proposal](#))

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NRCC 100-2010, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW76-14: 605.1.1.2 (NEW)-SCHEIB1156

GEW77-14

202 (New), 605.1.2.1

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC GENERAL CODE DEVELOPMENT COMMITTEE.

Proponent: Jason Wilen, National Roofing Contractors Association, representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

Revise as follows:

605.1.2.1 Air barriers. A continuous air barrier shall be provided for buildings in climate zones 1 through 8 in accordance with Section C402.4.1 of the *International Energy Conservation Code*. The exception in Section C402.4.1 of the *International Energy Conservation Code* shall not apply.

Exception: Provided the energy use of the building is not increased, air barriers shall not be required for roof repair, roof recover, and roof replacement where the alterations, renovations or repairs to the building do not also include alteration, renovations or repairs to the remainder of the building envelope.

Add new definition as follows:

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

ROOF RECOVER. The process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

Reason: The purpose of this code change is to clarify the intent of the code. A public comment for proposal CE165-13 was approved during the Group B Public Comment Hearings and will therefore the same text proposed in this proposal will appear in IECC 2015. Arguments made by supporters of the approved proposal made clear the exception language is acknowledging that fact that, for a simple reroofing project, a functional building envelope air barrier is not achievable without also requiring a major and prohibitory expensive expansion of the project scope to include significant work to the non-roof portions of the building envelope. It is not the intent of the code to require a full-scale building envelope restoration in situations where, for example, a roof coating is added to an existing building. The same logic holds true for the IgCC. Even in an above minimum code environment with more stringent provisions, the proposed text clarifies the intent of the code for a building owner to be allowed to simply replace a failing roof system or enhance an existing roof system.

As with the exception approved for IECC 2015, the proposed change would not apply to new construction or extensive renovation where a functional building envelope air barrier can reasonably be incorporated into a project.

The proposed definitions will also appear in IECC 2015 (per proposal CE56-13 that was part of the consent agenda during the Group B Public Comment Hearing) and the inclusion of the terms in IgCC 2015 will ensure the terms are defined the same way in each document.

Cost Impact: Will not increase the cost of construction

Analysis: The International Energy Conservation Code sections C402.4.1 and C402.4.1 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Edition will be C402.5 and C402.5.1.

GEW77-14: 605.1.2.1-WILEN858

GEW78-14

605.1.2.2

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

Revise as follows:

605.1.2.2 Testing requirement. ~~The building thermal envelope air tightness shall be considered to be acceptable where the tested and the air leakage rate of the total area of the building thermal envelope is less than shall not exceed~~ 0.25 cfm/ft² under a pressure differential of 0.3 in water column (1.57 lb/ft²) (1.25 L/s.m² under a pressure differential of 75 Pa). Testing shall occur after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, heating, ventilating and air-conditioning (HVAC) systems, plumbing, and electrical equipment and appliances. Testing shall be done in accordance with ASTM E 779. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner. Where the tested rate exceeds 0.25 cfm/ft², a visual inspection of the air barrier shall be conducted and any leaks noted shall be sealed to the extent practicable. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner, and shall be deemed to satisfy the requirements of this section.

Reason: This proposal allows a compliance option for buildings that fail to meet the air leakage test. The current code requires all buildings to have no more than 0.25 cfm/ft² of leakage through the envelope. While most buildings will pass the test, certain types of buildings present difficulties because of air volume or other causes. This proposal allows them to comply with the code by correcting deficiencies "to the extent practicable".

Cost Impact: Will not increase the cost of construction.

GEW78-14: 605.1.2.2-TRAXLER665

GEW79-14

605.1.2.3

Proponent: Amanda Hickman, InterCode Incorporated, representing AMCA (Air Movement and Control Association (amanda@intercodeinc.com))

Delete and substitute as follows:

~~605.1.2.3 Air curtains. Where a building entrance is required to be protected with a vestibule in accordance with the *International Energy Conservation Code*, an air curtain tested in accordance with ANSI/AMCA 220 is permitted to be used as an alternative to separate conditioned space from the exterior.~~

Where air curtains are provided at building entrances or building entrance vestibules, the curtain shall have a minimum velocity of 2 m/s at the floor, be tested in accordance with ANSI/AMCA 220 and installed in accordance with manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3 of the *International Energy Conservation Code*.

Reason: In its current form, the language in the IgCC is redundant and not needed. A similar provision for air curtains as alternatives to vestibules was recently approved into the 2015 IECC.

However, if this section of the IgCC is deleted rather than revised to what is being proposed, there will be no requirements for air curtains when they are installed to supplement the thermal protection of vestibules. Providing both a vestibule and an air curtain at a building entrance is a common practice in high-performance buildings. This proposal requires that when an air curtain is installed in addition to a vestibule, it must be tested to the appropriate standard, installed properly, and function as intended.

Cost Impact: Will not increase the cost of construction.

GEW79-14: 605.1.2.3-HICKMAN691

GEW80-14

605.1.2.3

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Delete without substitution:

~~**605.1.2.3 Air curtains.** Where a building entrance is required to be protected with a vestibule in accordance with the *International Energy Conservation Code*, an air curtain tested in accordance with ANSI/AMCA 220 is permitted to be used as an alternative to separate conditioned space from the exterior.~~

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

CE192-13 was approved as modified by public comment in Atlantic City to add air curtains as an option for compliance in the IECC vestibule requirements. As a result, the additional option is no longer needed in the IgCC. The text of the IECC vestibule section for 2015 will be as follows:

C402.5.7 Vestibules. All building entrances shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the building entrance shall not eliminate the requirement that a vestibule be provided on any doors adjacent to revolving doors.

Exceptions: Vestibules are not required for the following:

1. Buildings in *climate zones* 1 and 2.
2. Doors not intended to be used by the public, such as doors to mechanical or electrical equipment rooms, or intended solely for employee use.
3. Doors opening directly from a *sleeping unit* or dwelling unit.
4. Doors that open directly from a space less than 3,000 square feet (298 m²) in area.
5. Revolving doors.
6. Doors that have an air curtain with a minimum velocity of 6.56 ft/s (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220, and installed in accordance with the manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.

Cost Impact: Will not increase the cost of construction. Removes redundant provision.

GEW80-14: 605.1.2.3-THOMPSON575

GEW81-14

605.2

Proponent: Brenda Thompson, Chair, representing ICC Sustainability, Energy, and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Delete without substitution:

~~**605.2 Roof replacement.** Above-deck insulation for roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (17-percent slope) shall be in accordance with Section 1003.2.7.~~

Reason: Section 605.2 of the IECC is unnecessary because the IgCC is an overlay to the IECC and the 2015 IECC already contains this requirement. Furthermore, specific existing building provisions should not be referenced in the other chapters of the code. This provision is simply a referral to Section 1003.2.7. It is unnecessary. Having references to some existing provisions and not all results in inconsistency in the code that could have legal implications.

The requirements of Section 1003.2.7, as shown below, are not really requirements. Section 1003.2, the parent section, references Sections 1003.2.1 through 1003.2.7, and any combination of these sections, or any single section, can be used to comply with Section 1003.2.

1003.2.7 Roof replacement insulation. For roof replacement on an existing building with insulation entirely above the deck and where the roof slope is less than two units vertical in 12 units horizontal (16-percent slope), the insulation shall conform to the energy conservation requirements for insulation entirely above deck in the *International Energy Conservation Code*.

Exception: Where the required R-value cannot be provided due to thickness limitations presented by existing rooftop conditions, including heating, ventilating and air-conditioning equipment, low door or glazing heights, parapet heights, proper roof flashing heights, the maximum thickness of insulation compatible with the available space and existing uses shall be installed.

The 2015 IECC provisions related to this topic are as follows:

C503.3 Building envelope. New building envelope assemblies that are part of the alteration shall comply with Sections C503.3.1 through C503.3.3.

C503.3.1 Roof replacement. For roof replacements, where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above deck, roof replacement shall include compliance with the requirements of Table C402.1.3 or Table C402.1.4.

(Balance of C503.3 subsections not shown)

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW81-14:605.2-THOMPSON756

GEW82-14

605.3 (New)

Proponent: Amy Dickie, Global Cool Cities Alliance, representing Global Cool Cities Alliance (amy@globalcoolcities.org)

Add new text as follows:

605.3 Roof surfaces. Roof surfaces of buildings in climates zones 1, 2 and 3 shall comply with Section C402.2.1.1 of the *International Energy Conservation Code* and roofing materials shall comply with the following requirements:

1. A minimum three-year aged solar reflectance of 0.65;
2. A minimum three-year aged thermal emittance of 0.75;
3. A minimum three-year aged solar reflectance index of 78.

Reason: This proposal adds a new sub-section to Section 605 Building Envelope Systems in Chapter 6 to address roof reflectivity and to enhance the reflectivity requirements by the reference code, International Energy Conservation Code (IECC). The International Green Construction Code (IgCC) is a code which provides building construction and operations requirements which should be more sustainable than those provided by the IECC, IBC, IMC, or IPC alone. The roof reflectivity requirements included in Chapter 6 should match leading "green codes", and should go above and beyond the reflectivity levels required in the IECC. This proposal requires that roofs materials comply with Section 402.3 of the IECC and with enhanced reflectivity requirements.

- We believe that IGCC should achieve parity with the reflectivity requirements in leading "green codes". The minimum solar reflectance and SRI values are consistent with the requirements in CalGreen Tier 2.
- The increase in solar reflectance requirement proposed here would generate almost 30 percent additional energy savings benefit above the current requirements, compared with a base case. The following equation, provided by the Heat Island Group at Lawrence Berkeley National Laboratory, describes the increase in annual energy savings of boosting the solar reflectance requirement from 0.55 to 0.65: $(0.65 - 0.20) / (0.55 - 0.20) - 1 = 29\%$. That is, if the albedo 0.55 roof saved 100 units of energy or money, the albedo 0.65 roof would save 129 units of energy or money. This equation assumes that thermal emittance levels remain constant.

Cost Impact: Will not increase the cost of construction

Analysis: The International Energy Conservation Code section C402.2.1.1 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section number for the 2015 Editions will be C402.3.

GEW82-14:605.3 (NEW) #2-DICKIE802

GEW83-14

605.3 (New)

Proponent: Amy Dickie, Global Cool Cities Alliance, representing Global Cool Cities Alliance (amy@globalcoolcities.org)

Add new text as follows:

605.3 Roof surfaces. Roof surfaces of buildings located in climate zones 4a and 4b shall comply with Section C402.2.1.1 of the *International Energy Conservation Code*.

Reason: This proposal adds a section to Ch 6 which requires that low-sloped roofs on commercial buildings in climate zones 4a and 4b comply with the reflectivity requirements provided by the International Energy Conservation Code (IECC).

IgCC is a code which provides building construction and operations requirements which should be more sustainable than those provided by the IECC, IBC, IMC, or IPC alone. Therefore, the roof surfaces requirements and should go above and beyond those required in the IECC and should take into account the urban heat island reduction benefits provided by reflective roofs. Reflective roofs have been proven to provide a number of benefits in climate zones 4a and 4b.

·Switching to reflective roofs across climate zones 4a and 4b generates net energy savings and net energy cost savings.

·Reflective roofs help reduce peak load in IECC climate zones 4a and 4b.

·The benefits of reflective roofs have been proven beneficial in major metropolitan areas within climate zones 4a and 4b. Several major cities in climate zone 4 have adopted the use of reflective roofs on commercial, low-sloped roofs into law.

·Reflective roofs provide a cooler environment for roof equipment, thus enabling better performance for rooftop equipment.

·In many cases roof construction can have a cool roof option with zero price premium. Some reflective roofs have small price premiums.

·Reflective roofs have many important co-benefits. For example, a large number of reflective roofs will reduce the summer air temperature in cities and therefore improve resiliency of urban populations to heat events.

Cost Impact: Will not increase the cost of construction

Analysis: The International Energy Conservation Code section C402.2.1.1 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section number for the 2015 Editions will be C402.3.

GEW83-14:605.3 (NEW) #4-DICKIE944

GEW84-14

605, 606

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner (craig.conner@mac.com)

Delete without substitution:

~~**605 BUILDING ENVELOPE SYSTEMS**~~

~~**606 BUILDING MECHANICAL SYSTEMS**~~

Reason: The intent of the proposal is to delete all of Sections 605 and 606. Building Envelop and Mechanical Systems should be deleted as that function is in the IECC. A good deal of this is just confusing.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GEW 84-14: 606-KLEIN1207

GEW85-14

606.2.2.1, 606.2.2.2

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

606.2.2.1 Ground source or geothermal heat pumps. The efficiency of ground source or geothermal heat pumps with a rated cooling capacity of 65,000 Btu/h or less shall comply with the provisions of Table 606.2.2.1 based on the applicable referenced test procedure.

**TABLE 606.2.2.1
ENERGY-EFFICIENCY CRITERIA FOR
GROUND SOURCE HEAT PUMPS**

PRODUCT TYPE ^a	MINIMUM EER	MINIMUM COP	TEST PROCEDURE
Water-to-Air Closed loop	44.4 <u>17.1</u>	3.3 <u>3.6</u>	ISO 13256-1
Water-to-Air Open loop	46.2 <u>21.1</u>	3.6 <u>4.1</u>	ISO 13256-1
Water-to-Water Closed loop	45.4 <u>16.1</u>	3.0 <u>3.1</u>	ISO 13256-2
Water-to-Water Open loop	49.4 <u>20.1</u>	3.4 <u>3.5</u>	ISO 13256-2
Direct Expansion (DX) or Direct GeoExchange (DGX)	45.0 <u>16.0</u>	3.5 <u>3.6</u>	AHRI 870

a. Efficiency values apply to systems with a maximum rated cooling capacity of 65,000 Btu/hour.
EER = Energy efficiency ratio, COP = Coefficient of performance.

606.2.2.2 Multi-stage ground source or geothermal heat pumps. The efficiency of multi-stage ground source or geothermal heat pumps shall comply with the provisions of Table 606.2.2.1 based on the applicable referenced test procedure.

Reason: This proposal updates the values in Table 606.2.2.1 to match the Tier 3 values for Energy Star geothermal heat pumps that went into effect in 2012. Information about these values can be found at the following web site:
http://www.energystar.gov/index.cfm?c=geo_heat.pr_crit_geo_heat_pumps

In addition, there is the following language on the Energy Star web site: "Commercial (i.e., 3-phase) units are not eligible for qualification under the ENERGY STAR specification at this time." To make this table more technically accurate, there is new wording to show that these values are only for units that have capacities that are usually associated with single family homes.

Also, the web site only contains a definition for a geothermal heat pump, not a "ground source" heat pump, as shown below. To avoid market place confusion, the word geothermal has been added back in to this section.

Geothermal Heat Pump A geothermal heat pump uses the thermal energy of the ground or groundwater to provide residential space conditioning and/or domestic water heating. A geothermal heat pump model normally consists of one or more factory-made assemblies that include indoor conditioning and/or domestic water heat exchanger(s), compressors, and a ground-side heat exchanger. A geothermal heat pump model may provide space heating, space cooling, domestic water heating, or a combination of these functions and may also include the functions of liquid circulation, thermal storage, air circulation, air cleaning, dehumidifying or humidifying. A geothermal heat pump system generally consists of one or more geothermal heat pump models, the ground heat exchanger(s), the air and/or hydronic space conditioning distribution system(s), temperature controls, and thermal storage tanks.

Cost Impact: Will not increase the cost of construction

GEW85-14: 606.2.2.1-ROSENSTOCK509

GEW86-14

606.2.2.3

Proponent: Amanda Hickman, InterCode Incorporated, representing AMCA (Air Movement and Control Association) (amanda@intercodeinc.com)

Revise as follows:

606.2.2.3 Minimum-Fan efficiency. ~~Stand-alone supply, return and exhaust Fans designed for operating with motors over 750 watts (1 hp) shall comply with the provisions of Section C403.2.12.3 of the *International Energy Conservation Code*, have an energy efficiency classification of not less than FEG71 as defined in AMCA 205 provided that the total efficiency of the fan at the design point of operation shall be within 10 percentage points of either the maximum total efficiency of the fan or the static efficiency of the fan.~~

Reason: Fan efficiency language was recently approved into both the 2015 IECC and 2013 ASHRAE 90.1. Similar language is being finalized into ASHRAE 189.1 In order to better coordinate with these documents, this sections needs to be revised as proposed.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code section referenced in the text of this proposal is a 2015 Edition reference. The provision referenced is new and does not exist in the 2012 IECC.

GEW86-14: 606.2.2.3-HICKMAN689

GEW87-14

606.2.2.4 (New), Table 606.2.2.4 (NEW), Chapter 12

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Add new text as follows:

606.2.2.4 Absorption Cooling Systems. The efficiency of absorption cooling systems shall comply with the provisions of Table 606.2.2.4 based on the test procedure referenced in the table.

**TABLE 606.2.2.4
ENERGY-EFFICIENCY CRITERIA FOR ABSORPTION COOLING SYSTEMS**

Product Type	Minimum IPLV	Minimum COP	Test Procedure
Air-Cooled, Single Effect	-	0.63	AHRI 560
Water-Cooled, Single Effect	-	0.74	AHRI 560
Indirect-Fired, Double Effect	1.10	1.05	AHRI 560
Direct Fired, Double Effect	1.05	1.05	AHRI 560

IPLV = Integrated part load value; COP = Coefficient of performance.

Add new standard as follows:

AHRI

560-00 Absorption Water Chilling and Water Heating Packages

Reason: This new table will ensure that absorption cooling systems, if used, will meet efficiency levels that are only about 5-6% improvements over their current minimums as shown in ASHRAE 90.1 and IECC. It should be noted that the minimum efficiency for this equipment has not changed since the 1999 version of ASHRAE 90.1, while the efficiency of nearly all, if not all other cooling equipment has increased significantly since that time.

These technologies with higher efficiencies are currently available on the market place, as shown on the following web sites:

http://www.khi.co.jp/english/news/detail/20130221_1e.html

http://www.hitachi-ap.com/products/business/chiller_heater/absorption/index.html

http://www.johnsoncontrols.com/content/dam/WWW/jci/be/integrated_hvac_systems/hvac_equipment/chiller_products/absorption_two_stage/155.17-EG1.pdf

Other factors to consider: Absorption technologies can be combined with solar hot water systems to use the solar heat to create cooling, thereby increasing the overall efficiency of the cooling system (which is very low compared to electric cooling systems). They also use water as the refrigerant.

Cost Impact: Will increase the cost of construction. There are higher initial costs associated with higher efficiency systems.

Analysis: The standard AHRI 560-00 is referenced by one or more 2012 I-codes.

GEW87-14: 606.2.2.4 (NEW)-ROSENSTOCK510

GEW88-14

606.3

Proponent: Marcelo Hirschler, gbh International, representing North American Flame Resistant Alliance (gbhint@aol.com)

Revise as follows:

606.3 Duct and plenum insulation, sealing and testing. Supply and return air ducts and plenums, air handlers and filter boxes shall be insulated and sealed in accordance with Section ~~C403.2.7.1.1~~ C403.2.7 of the *International Energy Conservation Code*. The exception in Section C403.2.7.1.1 shall not apply.

Reason: The reference to Section C403.2.7.1.1 of the IECC is an incorrect reference and inconsistent with the scope of this section of the IgCC since C403.2.7.1.1 addresses only some of the duct systems covered by the IgCC section. Section C403.2.7.1.1 of the IECC addresses purely low-pressure duct systems, while the IgCC section addresses duct and plenum insulation, sealing and testing. The proposed reference, section C403.2.7 of the IECC, addresses duct and plenum insulation and sealing and will, thus, cover the complete aspects of insulation, sealing and testing in accordance with the IMC and IECC. In particular, also, all the requirements associated with plenums, contained within section 602 of the IMC, are covered by section C403.2.7.1 of the IECC which sends the user to the IMC and, implicitly, to chapter 6 of the IMC. The relevant IECC sections are shown below.

C403.2.7 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of R-6 insulation where located in unconditioned spaces and a minimum of R-8 insulation where located outside the building. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation.

Exceptions:

1. Where located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

All ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the *International Mechanical Code*.

C403.2.7.1 Duct construction. Ductwork shall be constructed and erected in accordance with the *International Mechanical Code*.

C403.2.7.1.1 Low-pressure duct systems. All longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches water gauge (w.g.) (500 Pa) shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus embedded-fabric systems or tapes installed in accordance with the manufacturer's installation instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

Exception: Continuously welded and locking type longitudinal joints and seams on ducts operating at static pressures less than 2 inches water gauge (w.g.) (500 Pa) pressure classification.

C403.2.7.1.2 Medium-pressure duct systems. All ducts and plenums designed to operate at a static pressure greater than 2 inches water gauge (w.g.) (500 Pa) but less than 3 inches w.g. (750 Pa) shall be insulated and sealed in accordance with Section C403.2.7. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

C403.2.7.1.3 High-pressure duct systems. Ducts designed to operate at static pressures in excess of 3 inches water gauge (w.g.) (750 Pa) shall be insulated and sealed in accordance with Section C403.2.7. In addition, ducts and plenums shall be leak-tested in accordance with the *SMACNA HVAC Air Duct Leakage Test Manual* with the rate of air leakage (CL) less than or equal to 6.0 as determined in accordance with Equation 4-5.

$$CL = F/P^{0.65} \text{ (Equation 4-5)}$$

where:

F = The measured leakage rate in cfm per 100 square feet of duct surface. P = The static pressure of the test.

Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code sections C403.2.7 and C403.2.7.1.1 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Editions will be C403.2.9 and C403.2.9.1.1, respectively.

GEW88-14: 606.3-HIRSCHLER951

GEW89-14

606.5.1, Table 606.5.1(1), Table 606.5.1(2)

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

606.5.1 Economizer systems. Each cooling system that has a fan shall include either an air economizer complying with Section 606.5.1.1 or a water economizer complying with Section 606.5.1.2.

Exception: Economizers are not required for the following:

1. ~~Individual fan-cooling units with a supply capacity less than the minimum listed in Table 606.5.1(1).~~ In cooling systems for buildings located in climate zones 1A and 1B.
2. In climate zones other than 1A or 1B, where individual cooling units have a capacity of less than 33,000 Btu/h. The total supply capacity of all fan-cooling units not provided with economizers shall not exceed 20 percent of the total supply capacity of all fan-cooling units in the building nor 480,000 Btu/h, whichever is greater.
3. In Group I-2 occupancies, hospitals, and Group B occupancies, ambulatory care facilities, where more than 75 percent of the air designed to be supplied by the system is to spaces that are required to be humidified above a 35°F (1.7°C) dew-point temperature to comply with applicable codes or accreditation standards. In other occupancies, where more than 25 percent of the air designed to be supplied by the system is to spaces that are designed to be humidified above a 35°F (1.7°C) dew-point temperature to satisfy process needs.
- ~~3.~~ 4. Systems that include a condenser heat recovery system that is designed to utilize 60 percent of the peak heat rejection load at design conditions and there is a documented need for that rejected heat for either service hot water or space heating during peak heat rejection design conditions.
- ~~4.~~ 5. Systems that serve spaces estimated as having a sensible cooling load at design conditions, excluding transmission and infiltration loads, of less than or equal to transmission and infiltration losses at the temperature and relative humidity design conditions in accordance with Section 6.1 of ASHRAE 55.
- ~~5.~~ 6. Where the use of outdoor air for cooling will affect supermarket open refrigerated casework systems.
- ~~6.~~ 7. Where the cooling efficiency is equal to, or greater than, the efficiency improvement requirements in Table ~~606.5.1(2)~~ 606.5.1.

**TABLE 606.5.1(1)
ECONOMIZER REQUIREMENTS**

CLIMATE ZONES	ECONOMIZER REQUIREMENT
1A, 1B	No requirement
2A, 2B, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 7, 8	Economizers on all cooling systems having a capacity \geq 33,000 Btu/h^a

For SI: 1 British thermal unit per hour = 0.293 W.

~~a. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building or 20 percent of the building's air economizer capacity, whichever is greater.~~

**TABLE 606.5.1(2)
EQUIPMENT EFFICIENCY PERFORMANCE EXCEPTION FOR ECONOMIZERS**

CLIMATE ZONES	COOLING EQUIPMENT EFFICIENCY IMPROVEMENT (%)^a
2A	17
2B	21
3A	27
3B	32
4A	42
4B	49

IPLV = Integrated part load value, IEER = Integrated energy-efficiency ratio, SEER = Seasonal energy-efficiency rating, EER = Energy-efficiency ratio, COP = Coefficient of performance

a. Where a unit is rated with an IPLV, IEER or SEER, the minimum values for these metrics shall be increased by the percentage listed in the table in order to eliminate the required air or water economizer. Where a unit is rated only with a full load metric such as EER or COP cooling, these metrics shall be increased by the percentage shown.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The intent of the change is to replace Table 606.5.1(1) with new exceptions 1 and 2. Table 606.5.1(1) is to be deleted and Table 606.5.1(2) to be renumbered. Code change CE243-13, shown below, was approved during the 2013 code development cycle. It reorganizes the parallel provisions in the IECC. The interaction between exception #1 and Table 606.5.1(1) is unclear. The exception states where economizers are not to be required, but the table appears to be a listing of economizer requirements. The intent is unclear as written. The proposal replaces the table with 2 exceptions which are clearly exceptions from an economizer requirement. The first exception addresses climate zones 1A and 1B where no economizers are required regardless of the system capacity. The second exception addresses the other climate zones currently covered by the last line of the table and the footnote. Similar revision was made to the Massachusetts Stretch Code to address the confusion of this section and table.

CE243 – 13

C403.3.1, Table C403.3.1(1)

Proponent: Brenda A. Thompson, Clark County Development Services, Clark County, Nevada, representing Sustainable/Energy/High Performance Code Action Committee (bat@clarkcounty.gov)

Revise as follows:

C403.3 Simple HVAC systems and equipment (Prescriptive). This section applies to buildings served by unitary or packaged HVAC equipment listed in Tables C403.2.3(1) through C403.2.3(8), each serving one *zone* and controlled by a single thermostat in the *zone* served. It also applies to two-pipe heating systems serving one or more *zones*, where no cooling system is installed.

C403.3.1 Economizers. Each cooling system that has a fan shall include either an air or water economizer meeting the requirements of Sections C403.3.1.1 through C403.3.1.1.4.

Exception: Economizers are not required for the systems listed below.

1. ~~Individual fan-cooling units with a supply capacity less than the minimum listed in Table C403.3.1(1).~~
1. In cooling systems for buildings located in climate zones 1A and 1B.
2. In climate zones other than 1A and 1B, where individual cooling units have a capacity of less than 33,000 Btu/h. The total supply capacity of all fan-cooling units not provide with economizers shall not exceed 20 percent of the total supply capacity of all fan-cooling units in the building nor 300,000 Btu/h, whichever is greater.
- 2-3. Where more than 25 percent of the air designed to be supplied by the system is to spaces that are designed to be humidified above 35°F (1.7 °C) dew-point temperature to satisfy process needs.
- 3-4. Systems that serve residential spaces where the system capacity is less than five times the requirement listed in Table C403.3.1(1).
- 4-5. Systems expected to operate less than 20 hours per week.
- 5-6. Where the use of outdoor air for cooling will affect supermarket open refrigerated casework systems.
6. 7. Where the cooling efficiency meets or exceeds the efficiency requirements in Table C403.3.1(2).

**TABLE C403.3.1(1)
ECONOMIZER REQUIREMENTS**

CLIMATE ZONES	ECONOMIZER REQUIREMENT
1A, 1B	No requirement
2A, 2B, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 7, 8	Economizers on all cooling systems \geq 33,000 Btu/ha

For SI: 1 British thermal unit per hour = 0.2931 W.

a. ~~The total capacity of all systems without economizers shall not exceed 300,000 Btu/h per building, or 20 percent of its air economizer capacity, whichever is greater.~~

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the SEHPCAC has held 3 open meetings and over 30 workgroup calls which included members of the SEHPCAC as well as any interested party to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Reasons for this specific proposal:

The interaction between exception #1 and Table C403.3.1(1) is unclear. The exception states where economizers are not to be required, but the table appears to be a listing of economizer requirements. The intent is unclear as written. The proposal replaces the table with 2 exceptions which are clearly exceptions from an economizer requirement. The first exception addresses climate zones 1A and 1B where no economizers are required regardless of the system capacity. The second exception addresses the other climate zones currently covered by the last line of the table and the footnote. Similar revision was made to the Massachusetts Stretch Code to address the confusion of this section and table.

The same format occurs in a parallel section in the IgCC. If this proposal is successful, the SEHPCAC will submit a companion proposal in 2014 for the IgCC.

Cost Impact: Will not increase the cost of construction. The proposal is editorial and will have no impact on the cost of construction.

GEW89-14: 606.5.1-THOMPSON564

GEW90-14

606.5.1

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org); Brenda Thompson, Chair, representing Sustainability, Energy, High Performance, Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

606.5.1 Economizer systems. Each cooling system that has a fan shall include either an air economizer complying with Section 606.5.1.1 or a water economizer complying with Section 606.5.1.2.

Exception: Economizers are not required for the following:

1. Individual fan-cooling units with a supply capacity less than the minimum listed in Table 606.5.1(1).
2. In Group I-2, Condition 2 occupancies, ~~hospitals~~, and ~~Group B occupancies~~, ambulatory care facilities, where more than 75 percent of the air designed to be supplied by the system is to spaces that are required to be humidified above a 35°F (1.7°C) dew-point temperature to comply with applicable codes or accreditation standards. In other occupancies, where more than 25 percent of the air designed to be supplied by the system is to spaces that are designed to be humidified above a 35°F (1.7°C) dew-point temperature to satisfy process needs.
3. Systems that include a condenser heat recovery system that is designed to utilize 60 percent of the peak heat rejection load at design conditions and there is a documented need for that rejected heat for either service hot water or space heating during peak heat rejection design conditions.
4. Systems that serve spaces estimated as having a sensible cooling load at design conditions, excluding transmission and infiltration loads, of less than or equal to transmission and infiltration losses at the temperature and relative humidity design conditions in accordance with Section 6.1 of ASHRAE 55.
5. Where the use of outdoor air for cooling will affect supermarket open refrigerated casework systems.
6. Where the cooling efficiency is equal to, or greater than, the efficiency improvement requirements in Table 606.5.1(2).

**TABLE 606.5.1(1)
ECONOMIZER REQUIREMENTS**

CLIMATE ZONES	ECONOMIZER REQUIREMENT
1A, 1B	No requirement
2A, 2B, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 7, 8	Economizers on all cooling systems having a capacity \geq 33,000 Btu/ha

For SI: 1 British thermal unit per hour = 0.293 W.

- a. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building or 20 percent of the building's air economizer capacity, whichever is greater.

**TABLE 606.5.1(2)
EQUIPMENT EFFICIENCY PERFORMANCE EXCEPTION FOR ECONOMIZERS**

CCLIMATE ZONES	COOLING EQUIPMENT EFFICIENCY IMPROVEMENT (%)^a
2A	17
2B	21
3A	27
3B	32
4A	42
4B	49

IPLV = Integrated part load value, IEER = Integrated energy-efficiency ratio, SEER = Seasonal energy-efficiency rating, EER = Energy-efficiency ratio, COP = Coefficient of performance

a. Where a unit is rated with an IPLV, IEER or SEER, the minimum values for these metrics shall be increased by the percentage listed in the table in order to eliminate the required air or water economizer. Where a unit is rated only with a full load metric such as EER or COP cooling, these metrics shall be increased by the percentage shown.

Reason: This code change coordinates this section with terminology within the current 2015 versions of the I-codes. Based on the results of the Group A ICC hearing cycle, Group I-2 has been split into two separate conditions: Condition 1 includes nursing homes, Condition 2 includes hospitals. Note that the original code change, G257-12, received a floor modification that switched the conditions. The description above represents the final outcome.

Ambulatory care facilities are defined as Group B occupancies, therefore the "Group B occupancies" can be deleted. If it is not deleted, this section could be misinterpreted to mean all Group B.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

GEW90-14: 606.5.1-PAARLBERG643

GEW91-14

606.5.1, Table 606.5.1(1), Table 606.5.1(2)

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

606.5.1 Economizer systems. Each cooling system that has a fan shall include either an air economizer complying with Section 606.5.1.1 or a water economizer complying with Section 606.5.1.2.

Exception: Economizers are not required for the following:

1. Individual fan-cooling units with a supply capacity less than the minimum listed in Table 606.5.1(1).
2. In Group I-2 occupancies, hospitals, and Group B occupancies, ambulatory care facilities, where more than 75 percent of the air designed to be supplied by the system is to spaces that are required to be humidified above a 35°F (1.7°C) dew-point temperature to comply with applicable codes or accreditation standards. In other occupancies, where more than 25 percent of the air designed to be supplied by the system is to spaces that are designed to be humidified above a 35°F (1.7°C) dew-point temperature to satisfy process needs.
3. Systems that include a condenser heat recovery system that is designed to utilize 60 percent of the peak heat rejection load at design conditions and there is a documented need for that rejected heat for either service hot water or space heating during peak heat rejection design conditions.
4. Systems that serve spaces estimated as having a sensible cooling load at design conditions, excluding transmission and infiltration loads, of less than or equal to transmission and infiltration losses at the temperature and relative humidity design conditions in accordance with Section 6.1 of ASHRAE 55.
5. Where the use of outdoor air for cooling will affect supermarket open refrigerated casework systems.
6. Where the cooling efficiency is equal to, or greater than, the efficiency improvement requirements in Table 606.5.1(2).

**TABLE 606.5.1(1)
ECONOMIZER REQUIREMENTS**

CLIMATE ZONES	ECONOMIZER REQUIREMENT
1A, 1B	No requirement
2A, 2B, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 7, 8	Economizers on all cooling systems having a capacity \geq 33,000 Btu/ha

For SI: 1 British thermal unit per hour = 0.293 W.

a. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building or 20 percent of the building's air economizer capacity, whichever is greater.

**TABLE 606.5.1(2)
EQUIPMENT EFFICIENCY PERFORMANCE EXCEPTION FOR ECONOMIZERS**

CCLIMATE ZONES	COOLING EQUIPMENT EFFICIENCY IMPROVEMENT (%)^a
2A	17
2B	21
3A	27
3B	32
4A	42
4B	49

IPLV = Integrated part load value, IEER = Integrated energy efficiency ratio, SEER = Seasonal energy efficiency rating, EER = Energy efficiency ratio, COP = Coefficient of performance

a. Where a unit is rated with an IPLV, IEER or SEER, the minimum values for these metrics shall be increased by the percentage listed in the table in order to eliminate the required air or water economizer. Where a unit is rated only with a full load metric such as EER or COP cooling, these metrics shall be increased by the percentage shown.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The footnote (a) does not clearly provide differences in application of the code. The first sentence of the note says if the equipment is rated by IPLV, IEER or SEER then you use the percentages of the table. The second sentence says if the equipment is rated with EER or COP then you use the percentages in the table. If there is a category where you don't use these efficiency improvements, then that would be the type of information to have in a footnote. The text of Exception 6 of Section 606.5.1 specifically says economizers aren't required when the cooling efficiency is improved per the table. The units applied to the equipment are irrelevant because the footnote says they are to be treated the same. Once footnote a is eliminated, then there is no need to the explanative definitions immediately below the table.

Cost Impact: Will not increase the cost of construction. The proposal is editorial as it eliminates a footnote that has no impact on the regulation.

GEW91-14: TABLE 606.5.1 (2)-THOMPSON570

GEW92-14

606.5.1.1.1, 606.5.1.1.2, 606.5.1.1.3, Table 606.5.1.1.3(1), Table 606.5.1.1.3 (2), 606.5.1.1.4, 606.5.1.2.1, 606.5.1.2.2, 606.5.1.2.3, 606.5.1.2.4, 606.5.1.1, 606.5.1.2

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

606.5.1.1 Air economizers. Air economizers shall be designed in accordance with Sections ~~606.5.1.1.1 through 606.5.1.1.4.~~ the *International Energy Conservation Code*.

606.5.1.1.1 Design capacity. ~~Air economizer systems shall be capable of modulating outdoor air and return air dampers to provide up to 100 percent of the design supply air quantity as outdoor air for cooling.~~

606.5.1.1.2 Control signal. ~~Economizer dampers shall be capable of being sequenced with the mechanical cooling equipment and shall not be controlled by only mixed air temperature.~~

Exception: ~~The use of mixed air temperature limit control shall be permitted for systems controlled from space temperature, such as single-zone systems.~~

606.5.1.1.3 High-limit shutoff. ~~Air economizers shall be capable of automatically reducing outdoor air intake to the design minimum outdoor air quantity when the outdoor air intake will not reduce cooling energy usage. High-limit shutoff control types for specific climates shall be chosen from Table 606.5.1.1.3(1). High-limit shutoff control settings for the Table 606.5.1.1.3(1) control types shall be as specified in Table 606.5.1.1.3(2).~~

**TABLE 606.5.1.1.3(1)
HIGH-LIMIT SHUTOFF CONTROL OPTIONS
FOR AIR ECONOMIZERS**

CLIMATE ZONES	ALLOWED CONTROL TYPES	PROHIBITED CONTROL TYPES
1B, 2B, 3B, 3C, 4B, 4C, 5B, 5C, 6B, 7, 8	Fixed dry bulb Differential dry bulb Electronic enthalpy ^a Differential enthalpy Dew point and dry bulb temperatures	Fixed enthalpy
1A, 2A, 3A, 4A	Fixed enthalpy Electronic enthalpy ^a Differential enthalpy Dew point and dry bulb temperatures	Fixed dry bulb Differential dry bulb
All other climates zones	Fixed dry bulb Differential dry bulb Fixed enthalpy Electronic enthalpy ^a Differential enthalpy Dew point and dry bulb temperatures	—

a. Electronic enthalpy controllers are devices that use a combination of humidity and dry-bulb temperature in their switching algorithm.

**TABLE 606.5.1.1.3(2)
HIGH-LIMIT SHUTOFF CONTROL SETTING FOR AIR ECONOMIZERS**

DEVICE TYPE	CLIMATE ZONE	REQUIRED HIGH LIMIT (Economizer off when)	
		Equation	Description of equation
Fixed dry bulb	1B, 2B, 3B, 3C, 4B, 4C, 5B, 5C, 6B, 7, 8	$T_{OA} > 75^{\circ}\text{F}$	Outdoor air temperature (T_{OA}) is greater than 75°F
	5A, 6A, 7A	$T_{OA} > 70^{\circ}\text{F}$	Outdoor air temperature (T_{OA}) is greater than 70°F
	All other zones	$T_{OA} > 65^{\circ}\text{F}$	Outdoor air temperature (T_{OA}) is greater than 65°F
Differential dry bulb	1B, 2B, 3B, 3C, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 7, 8	$T_{OA} > T_{RA}$	Outdoor air temperature (T_{OA}) is greater than return air temperature (T_{RA})
Fixed enthalpy	All	$h_{OA} > 28 \text{ Btu/lb}^a$	Outdoor air enthalpy (h_{OA}) is greater than 28 Btu/lb of dry air ^a
Electronic enthalpy	All	$(T_{OA}/RH_{OA}) > A$	Outdoor air temperature (T_{OA}) divided by RH_{OA} is greater than the "A" setpoint curve ^b
Differential enthalpy	All	$h_{OA} > h_{RA}$	Outdoor air enthalpy (h_{OA}) is greater than return air enthalpy (h_{RA})
Dew point and dry bulb temperatures	All	$DP_{OA} > 55^{\circ}\text{F}$	Outside dew point (DP_{OA}) is greater than 55°F
		or $T_{OA} > 75^{\circ}\text{F}$	or Outdoor air dry bulb (T_{OA}) is greater than 75°F

For SI: $^{\circ}\text{C} = ((^{\circ}\text{F}) - 32)/1.8$, 1 foot = 304.8 mm, 1 British thermal unit per pound = 2326 J/Kg.

a. At altitudes substantially different than sea level, the fixed enthalpy limit shall be set to the enthalpy value at 75°F and 50-percent relative humidity. As an example, at approximately 6000 feet elevation the fixed enthalpy limit is approximately 30.7 Btu/lb.

b. Setpoint "A" corresponds to a curve on the psychometric chart that goes through a point at approximately 75°F and 40-percent relative humidity and is nearly parallel to dry-bulb lines at low humidity levels and nearly parallel to enthalpy lines at high humidity levels

606.5.1.1.4 Relief of excess outdoor air. Systems shall provide a means to relieve excess outdoor air during air economizer operation to prevent over-pressurizing of the building. The relief air outlets shall be located to avoid recirculation of the relief of air into the building.

606.5.1.2 Water economizer systems for HVAC equipment. Water Economizer systems for heating, ventilating and air-conditioning (HVAC) equipment shall be designed in accordance with Sections 606.5.1.2.1 through 606.5.1.2.4. the International Energy Conservation Code.

606.5.1.2.1 Design capacity. Water economizer systems shall be capable of cooling supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at outdoor air temperatures of 50°F (10°C) dry bulb/45°F (7.2°C) wet bulb and below.

Exception: Systems in which a water economizer is used and where dehumidification requirements cannot be met using outdoor air temperatures of 50°F (10°C) dry bulb/45°F (7.2°C) wet bulb, shall satisfy 100 percent of the expected system cooling load at 45°F (7.2°C) dry bulb/40°F (4.4°C) wet bulb.

606.5.1.2.2 Maximum pressure drop. Precooling coils and water to water heat exchangers used as part of a water economizer system shall have a water side pressure drop of less than 15 feet of water column (44 835 Pa) including the control valve or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling noneconomizer mode.

606.5.1.2.3 Integrated economizer control. Economizer systems shall be integrated with the mechanical cooling system and shall be capable of providing partial cooling whether or not additional mechanical cooling is required to meet the remainder of the cooling load.

606.5.1.2.4 Economizer heating system impact. Heating, ventilating and air conditioning (HVAC) system design and economizer controls shall be so that economizer operation does not increase the building heating energy use during normal operation.

Exception: Economizers on variable air volume (VAV) systems that cause zone level heating to increase because of reduction in supply air temperature.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The provisions in the International Energy Conservation Code for 2015 that regulate economizers have been significantly revised and made more stringent. Section 606.5.1 specifies when HVAC systems do, and do not, need to be provided with economizers. Section 606.5.1.1 provides installation standards for air economizers; Section 606.5.1.2 provides installation standards for water economizers. The details of these sections are not as comprehensive as the similar standards provided in the 2015 IECC. This proposal would maintain the requirements and exceptions for economizers, but then refers the code user to the IECC for the requirements of the two types of economizers. The text to be deleted includes deleting tables 606.5.1.1.3(1) and (2).

Cost Impact: Will not increase the cost of construction. As this change removes requirements which would be in conflict with the IECC, there is no cost increase created by this change. If there is a cost increase it occurred with the change in standards in the IECC.

GEW92-14: 606.5.1.1-THOMPSON565

GEW93-14

606.7

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Delete without substitution:

~~**606.7 Kitchen exhaust systems.** Kitchen ventilation and exhaust systems shall be in accordance with the *International Mechanical Code* and this section. Kitchen ventilation systems that deliver conditioned supply air to any space containing a kitchen hood shall not be capable of exceeding the greater of the following:~~

- ~~1. The ventilation rate required to supply the space conditioning load; or~~
- ~~2. The hood exhaust flow minus the available transfer air from adjacent spaces. For the purposes of this section, available transfer air is considered to be that portion of outdoor ventilation air not required to satisfy other exhaust needs, such as restrooms, and not required to maintain pressurization of adjacent spaces.~~

~~Where the total hood exhaust airflow rate of kitchen hoods in the space is greater than 5,000 cfm (2360 L/s) each hood shall have an exhaust rate in not greater than 110 percent of the minimum exhaust rate required by the *International Mechanical Code* and the ventilation system shall comply with one of the following:~~

- ~~1. Not less than 50 percent of replacement air is transfer air that would otherwise be exhausted.~~
- ~~2. Demand ventilation systems that are capable of reducing exhaust and replacement air system airflow rates by not less than 50 percent for not less than 75 percent of the exhaust air. The demand ventilation system shall include controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and when idle.~~
- ~~3. Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40 percent shall be provided for not less than 50 percent of the total exhaust air.~~

~~Where a single hood, or hood section, is installed over appliances with different duty ratings, the maximum allowable flow rate for the hood or hood section shall be based on the requirements for the appliance with the highest duty rating located under the hood or hood section.~~

~~**Exception:** Where not less than 75 percent of the replacement air provided by the kitchen ventilation and exhaust system is transfer air that would otherwise be exhausted, the provisions of this section shall not apply.~~

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Code change CE220-13 was approved in 2013. It results in new kitchen exhaust provisions being added to the IECC. Therefore, the provisions in the IgCC are not a significant energy improvement over the IECC. The SEHPCAC proposes to delete the provisions. If other proponents pursue proposals which will take the new IECC provisions and enhance their energy savings when applied under the IgCC, the SEHPCAC will consider withdrawal of this proposal. The text of the IECC kitchen exhaust provisions for 2015 are as follows:

C403.2.8 Kitchen exhaust systems. Replacement air introduced directly into the exhaust hood cavity shall not be greater than 10 percent of the hood exhaust airflow rate. Conditioned supply air delivered to any space containing a kitchen hood shall not exceed the greater of the ventilation rate required to meet the space heating or cooling load or the hood exhaust flow minus the available transfer air from adjacent space where available transfer air is considered that portion of outdoor ventilation air not required to satisfy other exhaust needs, such as restrooms, and not required to maintain pressurization of adjacent spaces.

Where total kitchen hood exhaust airflow rate is greater than 5,000 cfm (2360 L/s), each hood shall be factory-built commercial exhaust hood listed by a nationally recognized testing laboratory in compliance with UL710. Each hood shall have a maximum exhaust rate as specified in Table C403.2.8 and shall comply with one of the following:

1. Not less than 50 percent of all replacement air shall be transfer air that would otherwise be exhausted.
2. Demand ventilation systems on not less than 75 percent of the exhaust air that are capable of no less than a 50 percent reduction in exhaust and replacement air system airflow rates, including controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle.
3. Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40 percent on not less than 50 percent of the total exhaust airflow.

Where a single hood, or hood section, is installed over appliances with different duty ratings, the maximum allowable flow rate for the hood or hood section shall be based on the requirements for the highest appliance duty rating under the hood or hood section.

Exception: Where not less than 75 percent of all the replacement air is transfer air that would otherwise be exhausted

**TABLE C403.2.8
MAXIMUM NET EXHAUST FLOW RATE, CFM PER LINEAR FOOT OF HOOD LENGTH**

Type of Hood	Light Duty Equipment	Medium Duty Equipment	Heavy Duty Equipment	Extra Heavy Duty Equipment
Wall-mounted canopy	140	210	280	385
Single island	280	350	420	490
Double island (per side)	175	210	280	385
Eyebrow	175	175	NA	NA
Backshelf/Pass-over	210	210	280	NA

For SI: 1 cfm = 0.4179 L/s; 1 foot = 305 mm
NA = Not Allowed

Cost Impact: Will not increase the cost of construction. The proposal removes a requirement which is duplicative of a requirement in the IECC.

GEW 93-14: 606.7-THOMPSON306

GEW94-14

606.8

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org); Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Delete without substitution:

~~**606.8 Laboratory exhaust systems.** Laboratory exhaust systems shall comply with the provisions of the *International Energy Conservation Code* except as specified in Section 606.8.1.~~

Reason: The International Energy Code does not include laboratory exhaust system requirements. So Section 606.8 is not needed. Section 606.8.1 can stand on it's own.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW94-14: 606.8-PAARLBERG645

GEW95-14

606.10 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

606.10 Fuel. Boilers, furnaces, and service water heating equipment configured to use #4 or #6 heating oils shall not be installed.

Reason: Requiring cleaner heating oils can improve public health. The types of pollution that results from burning heating oil (specifically PM2.5 and NOx) have been linked to many health problems, most notably asthma and other respiratory ailments. Conversion from dirtier-burning heating oils (such as #4 and #6 oil) to cleaner fuels (natural gas or #2 oil) can reduce this pollution, as well as CO2 emissions.

In 2011, New York City enacted rules that phase out #6 oil, prohibiting its burning after July 1, 2015. #4 oil, which is much less commonly used, is being phased out with a final prohibition date of January 1, 2030.

Bibliography:

NYC Green Codes Task Force, Proposal HT9: Phase Out Dirty Boiler Fuels ([Proposal](#); [Legislative Summary](#))
NYC Department of Environmental Protection Rules, Title 15, Chapter 2 ([DEP Rule](#))

Cost Impact: Will not increase the cost of construction.

GEW95-14:606.10 (NEW)-SCHEIB1113

GEW 96-14

607.1, 607.2, 607.2.1, 607.2.2, 607.3, 607.3.1, 607.4, 607.6, 607.7

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner, representing self (craig.conner@mac.com)

Revise as follows:

~~**607.1 Prescriptive compliance. Scope.** Where buildings are designed using the prescriptive-based compliance path in accordance with Section 601.3.2, Service water heating systems shall comply with the provisions of the *International Energy Conservation Code* and the provisions of this section.~~

~~**607.2 Service water heating (SWH) equipment performance requirements.** Service water heating equipment shall comply with Sections 607.2.1 and 607.2.2.~~

~~**607.2.1 Equipment covered by federal standards.** Equipment covered by federal minimum efficiency standards shall comply with the minimum efficiency requirements of the *International Energy Conservation Code*.~~

~~**607.2.2 Water heater controls for dwelling units.** Water heaters installed in dwelling units in buildings shall be equipped with external water temperature thermostat controls. The controls shall allow the occupant to set the water temperature at a setting that is below 100°F (38°C) and greater than or equal to 50°F (10°C).~~

~~**607.3 Pools, hot tubs and spas.** Pools, hot tubs and spas shall comply with the efficiency requirements of the *International Energy Conservation Code*.~~

~~**607.3.1 Pools in conditioned space.** For pools that are located within the conditioned space, not less than 25 percent of the annual energy consumption of pool operation and not less than 50 percent of the peak design space heating, ventilation, and cooling requirements for the space in which the pool is located shall be by one or both of the following:~~

- ~~1. An onsite renewable energy system.~~
- ~~2. A heat recovery system.~~

~~**607.4 Snowmelt systems.** Snow melt systems shall comply with the requirements of the *International Energy Conservation Code*. Hydronic systems shall supplement not less than 25 percent of the design snow melting total annual consumption measured in Btu/ft^2 (J/m^2), energy per unit area. Electric systems shall supplement not less than 50 percent of the design snow melt peak load demand. These requirements shall be supplied by one or both of the following:~~

- ~~1. An onsite renewable energy system.~~
- ~~2. A heat recovery system.~~

~~**Exception:** Emergency service ingress and egress are exempt from the requirements of Section 607.4.~~

~~**607.6 Service water heating piping insulation.** Service water heating piping shall be thermally insulated in accordance with Table 606.4. Where hot water distribution piping is installed within attics and crawlspaces, the insulation shall continue to cover the pipe for a distance not less than 6 inches (152 mm) beyond the *building thermal envelope*. Where hot water distribution piping is installed within walls, the insulation shall completely surround the pipe with not less than 1 inch (25 mm) of insulation. Where hot water piping is installed in a wall cavity of insufficient size to accommodate the pipe and insulation levels of Table 606.4, the insulation thickness shall be permitted to have the maximum thickness that the wall cavity can accommodate, but not less than $\frac{1}{2}$ -inch (12 mm) thick.~~

~~**Exception:** Insulation is not required for the following:~~

- ~~1. Factory installed piping within service water heating equipment tested and rated in accordance with Section 606.4.~~
- ~~2. Piping conveying fluids that is neither heated nor cooled, including cold water supply and natural gas piping.~~
- ~~3. Hot water supply piping exposed under sinks, lavatories and similar fixtures.~~
- ~~4. Hot water distribution piping buried within blown-in or sprayed roof/ceiling insulation, such as fiberglass or cellulose, where the insulation completely and continuously surrounds the pipe.~~

~~**607.7 Circulating hot water systems.** Controls that allow continuous, timer, or water temperature initiated (aquastat) operation of a circulating pump are prohibited. Gravity or thermosyphon circulation loops are prohibited. Pumps on circulating hot water systems shall be activated on demand by either a hard-wired or wireless activation control of one of the following types:~~

- ~~1. A normally open, momentary contact switch.~~
- ~~2. Motion sensors that make momentary contact when motion is sensed. After the signal is sent, the sensor shall go into a lock-out mode for not less than 5 minutes to prevent sending a signal to the electronic controls while the circulation loop is still hot.~~
- ~~3. A flow switch.~~
- ~~4. A door switch.~~

~~The controls for the pump shall be electronic and operate on the principal of shutting off the pump with a rise in temperature. Electronic controls shall have a lock-out to prevent operation at temperatures greater than 105°F (41°C) in the event of failure of the device that senses temperature rise. The electronic controls shall have a lock-out mode for not more than 5 minutes that prevents extended operation of the pump if the sensor fails or is damaged.~~

Reason: The sections that have been deleted are covered in the IECC or the IPC.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions

GEW 96-14: 607.1-KLEIN1209

GEW97-14

607.5, Chapter 12

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

607.5 Waste Drain water heat recovery system. The following ~~building types~~ occupancies shall be provided with a ~~waste drain water heat recovery system units~~ that will preheat the incoming water used for hot water functions by not less than 10°F (5.6°C):

1. Group A-2, occupancy restaurants and banquet halls;
2. Group F, occupancy laundries;
3. Group R-1, occupancy boarding houses (~~transient~~), hotels (~~transient~~), motels (~~transient~~);
4. Group R-2 occupancy buildings;
5. Group A-3, occupancy health clubs and spas; and
6. Group I-2, occupancy, Condition 1 hospitals, psychiatric hospitals and Condition 2 nursing homes.

Exception: ~~Waste Drain~~ water heat recovery systems ~~are~~ shall not be required for single-story slab-on-grade and single-story on crawl-space buildings.

Drain water heat recovery units shall comply with CSA B55.2. Potable water-side pressure loss shall be less than 10 psi at maximum design flow. For Group R occupancies, the efficiency of drain water heat recovery units shall be in accordance with CSA B55.1.

Add new standards as follows:

CSA

B55.1-2012 Test method for measuring efficiency and pressure loss of drain water heat recovery units.

B55.2-2012 Drain water heat recovery units.

Reason: This proposal has 2 goals:

1. Provide coordination with CE283-13 which was approved in 2013. It provides references to two standards for drain water heat recovery units in the 2015 IECC. However, the IECC doesn't require drain water heat recovery, but it does provide 2 referenced standards which must be met if and where drain water heating is installed in a building. Section 607.5 of the IgCC specifically requires drain water heat recovery in specified occupancies and uses. The text of the IECC drain water heat recovery provisions for 2015 are as follows:

C404.8 Drain water heat recovery units. Drain water heat recovery units shall comply with CSA 55.2. Potable water-side pressure loss shall be less than 10 psi at maximum design flow. For Group R occupancies, the efficiency of drain water heat recovery unit efficiency shall be in accordance with CSA 55.1.

The proposal coordinates with the new terminology in the 2015 IECC while maintaining the requirement that the units be provided in the specified occupancies.

2. Clarifies the application of the section to various occupancies and not to 'buildings'. This will clarify that if a building is of mixed occupancy that the drain water heat recovery requirements be applied to the portions of the building containing the listed occupancies. This will prevent the misunderstanding such as an 10 story office building with a health club on the first floor having to provide drain water heat recovery for the whole building rather than just the health club portion. 'Transient' is deleted from the listings under the R-1 occupancy because the IBC specifies that R-1 occupancy is transient in nature.

Cost Impact: Will not increase the cost of construction

This is primarily an editorial proposal to coordinate the provisions of the IECC and the IgCC. If there is a cost increase, it was established by adding the reference standards in the IECC.

Analysis:

A review of the standard proposed for inclusion in the code, CSA B55.1-2012 and CSA B55.2-2012 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW97-14: 607.5-THOMPSON576

GEW98-14

607.5, A106.3.2

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

607.5 Waste water heat recovery system. The following building types shall be provided with a waste water heat recovery system that will preheat the incoming water used for hot water functions by not less than 10°F (5.6°C):

1. Group A-2, restaurants and banquet halls;
2. Group F, laundries;
3. Group R-1, boarding houses (transient), hotels (transient), motels (transient);
4. Group R-2 buildings;
5. Group A-3, health clubs and spas; and
6. Group I-2 ~~facilities, hospitals, psychiatric hospitals and nursing homes.~~

Exception: Waste water heat recovery systems are not required for single-story slab-on-grade and single-story on crawl-space buildings.

A106.3.2 Occupancy. The building shall be designed to serve one of the following occupancies:

1. Group A-2, restaurants and banquet halls;
2. Group F, laundries;
3. Group R-1, boarding houses (transient), hotels (transient), motels (transient);
4. Group R-2 buildings;
5. Group A-3, health clubs and spas; and
6. Group I-2 ~~facilities, hospitals, mental hospitals and nursing homes.~~

Reason: These changes are editorial. The list is not needed as it includes all Group I-2 facilities. Similar proposals are provided for Section 604.3, 606.5.1 and 607.5.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at:

<http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

GEW98-14:607.5 #1-PAARLBERG668

GEW99-14

607.5

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

607.5 Waste water heat recovery system. The following building types shall be provided with a waste water heat recovery system that will preheat the incoming water used for hot water functions by not less than 10°F (5.6°C):

1. Group A-2, restaurants and banquet halls;
2. Group F, laundries;
3. Group R-1, boarding houses (transient), hotels (transient), motels (transient);
4. Group R-2 buildings;
5. Group A-3, health clubs and spas; and
6. Group I-2, ~~hospitals, psychiatric hospitals and~~ nursing homes.

Exception: Waste water heat recovery systems are not required for single-story slab- on-grade and single-story on crawl-space buildings.

Reason: Legionellosis is a recognized hazard that can kill or cause serious physical harm to building occupants. The term Legionellosis refers collectively to two distinct clinical illnesses, Legionnaires' disease and Pontiac fever. Legionnaires' disease is when the bacterium Legionella causes severe pneumonia. Pontiac fever is when Legionella infection results in a less severe, non-pneumonic, influenza-like illness. The US Centers for Disease Control and Prevention (CDC) has estimated that there are between 8,000 and 18,000 cases of Legionnaires' disease in the United States each year, and that more than 10 percent of these cases are fatal. Legionellosis results predominantly from exposure to Legionella associated with building water systems. Estimates suggest that 20% of Legionnaires' disease cases are outbreak related (more than one confirmed case in a one year period), but the majority are not outbreak-related (sporadic) (MMWR 2011). Outbreaks have been associated with whirlpool spas, cooling towers, decorative fountains, hotels, water systems of hospitals and nursing homes, and cruise ships. Persons at increased risk for legionellosis include, but are not limited to, the elderly, dialysis patients, persons who smoke, and persons with underlying medical conditions that weaken the immune system. However, a significant percentage of cases are in persons that are not part of any identified at-risk population. Building water systems vary substantially in their design and propensity for transmission of Legionella. Conditions that are favorable for the amplification of legionellae growth include the presence of other bacteria, amoebae and other protozoan hosts, water temperatures of 25-42°C (77-108°F), stagnation, scale, sediment and biofilms. Legionellosis is not transmitted person-to-person. Multiple modes have been identified for transmission of *Legionella* to humans; there is evidence for aerosolization, aspiration, and direct instillation into the lung during medical procedures. In most instances, transmission to humans occurs when water that contains *Legionella* is aerosolized in respirable droplets

Legionella Transmission From Nature to Human Disease

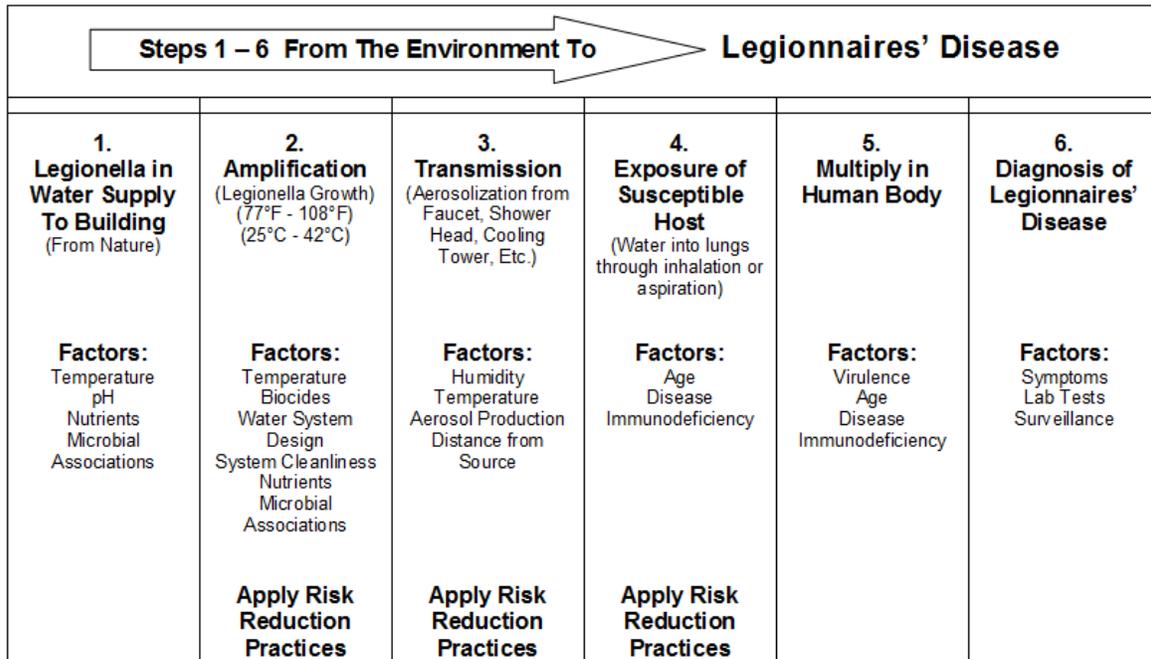


Figure 1 Legionella Transmission: Factors and events leading to Legionnaires' disease.

Adapted from Barbaree (1991)³

The most effective control for most diseases, including legionellosis, is prevention of transmission at as many points as possible in the disease's chain of transmission. The rationale for this is that if one preventive measure fails, others will be in place and act as failsafe mechanisms. With this philosophy in mind, it may be desirable to design interventions to prevent transmission of legionellosis at as many points as possible in the disease's chain of transmission. General concepts are presented so that readers may develop an understanding of the types of conditions that may allow amplification and transmission of Legionella.

Maintaining hot and cold water temperatures within prescribed ranges throughout the entire system has been shown to reduce the proliferation of Legionella. Cold water should be distributed and delivered at temperatures below

77°F (25°C). If cold water temperatures exceed 77°F (25°C) in any part of the system, the potential for proliferation of Legionella increases significantly. ASHRAE GUIDELINE Reducing the Risk of Legionellosis Associated with Building Water Systems, Copyright 2000 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

A Waste Water Heat Recovery System is designed to recover heat from the hot water used in showers, bathtubs, sinks, dishwashers, and clothes washers. They generally have the ability to store recovered heat for later use. These systems will impact the ability to properly control the water temperature within parts of the plumbing systems providing prime opportunities for the proliferation of Legionella and other bacteria within the building water system and therefore expose the high risk population.

Cost Impact: Will not increase the cost of construction.

GEW99-14: 607.5 #2-PAARLBERG1142

GEW 100-14

607.5, Chapter 12

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

607.5 Waste water heat recovery system. The following building types shall be provided with a waste water heat recovery system in accordance with CSA B55 2 that will preheat the incoming water used for hot water functions by not less than 10°F (5.6°C):

1. Group A-2, restaurants and banquet halls;
2. Group F, laundries;
3. Group R-1, boarding houses (transient), hotels (transient), motels (transient);
4. Group R-2 buildings;
5. Group A-3, health clubs and spas; and
6. Group I-2, hospitals, psychiatric hospitals and nursing homes.

Exception: Waste water heat recovery systems are not required for single-story slab-on-grade and single-story on crawl-space buildings.

Add new standard as follows:

CSA

B55 2-2012 Drain water heat recovery units.

Reason: Addition of reference to CSA B55.2 "Drain water heat recovery units" provides minimum standard for waste water heat recovery systems to be in compliance with.

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, CSA B55.2-2012 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW 100-14: 607.5-REIHELD1204

GEW101-14

607.5

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Delete and substitute as follows:

607.5 Waste water heat recovery system. ~~The following building types shall be provided with a waste water heat recovery system that will preheat the incoming water used for hot water functions by not less than 10°F (5.6°C):~~

- ~~1. Group A-2, restaurants and banquet halls;~~
- ~~2. Group F, laundries;~~
- ~~3. Group R-1, boarding houses (transient), hotels (transient), motels (transient);~~
- ~~4. Group R-2 buildings;~~
- ~~5. Group A-3, health clubs and spas; and~~
- ~~6. Group I-2, hospitals, psychiatric hospitals and nursing homes.~~

~~**Exception:** Waste water heat recovery systems are not required for single-story slab-on-grade and single-story on-crawl-space buildings.~~

607.5 Waste water heat recovery system. One or more drain water heat exchangers shall be installed in the drain piping system for the indicated plumbing fixtures and appliances in the following the building occupancies:

1. Laundry washing machines for laundry services in Group F occupancies.
2. Laundry washing machines that are connected to hot and cold water supplies, for boarding houses with transient occupants, hotels with transient occupants and motels with transient occupants in Group R-1 occupancies.
3. Shared shower facilities and laundry washing machines in Group R-2 occupancies.
4. Laundry washing machines that are connected to hot and cold water supplies, and showers for health clubs and spas in Group A-3 occupancies.
5. Laundry washing machines that are connected to hot and cold water supplies, patient showers for long-term care patients and staff showers for hospitals, mental hospitals and nursing homes in Group I-2 occupancies.

Exceptions: Drain water heat exchangers shall not be required for:

1. Laundry washing machines that are used by guests.
2. Laundry washing machines that are supplied with cold water only provided that space and access are available for adding a drain water heat exchanger to the drain system in the future.
3. Fixtures and appliances that are located on a concrete slab on grade.
4. Applications where a drain water heat exchanger cannot increase the incoming water temperature by 36 percent of the temperature difference between the incoming cold water and the drain water.

5. Applications where any portion of a drain water heat exchanger would be required to be located in a sump below grade.
6. Applications where a drain water heat exchanger would convey grease-laden waste that requires the installation of a grease or oil separator in accordance with Section 1003 of the *International Plumbing Code*.

Reason: The current wording in the 2012 IgCC was not clear as to what functions within the specified occupancies drain water heat exchangers should be installed on. In addition it is not practical to verify the percent reduction in energy usage for all hot water when only a few functions will be connected to the heat exchangers.

This proposal makes the requirements more specific, provides clearer exemptions and makes inspection easier to implement.

Cost Impact: Will not increase the cost of construction. These provisions are already in the 2012 IgCC.

GEW101-14: 607.5-KLEIN964

GEW102-14

607.6

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Delete without substitution:

~~**607.6 Service water heating piping insulation.** Service water heating piping shall be thermally insulated in accordance with Table 606.4. Where hot water distribution piping is installed within attics and crawlspaces, the insulation shall continue to cover the pipe for a distance not less than 6 inches (152 mm) beyond the *building thermal envelope*. Where hot water distribution piping is installed within walls, the insulation shall completely surround the pipe with not less than 1 inch (25 mm) of insulation. Where hot water piping is installed in a wall cavity of insufficient size to accommodate the pipe and insulation levels of Table 606.4, the insulation thickness shall be permitted to have the maximum thickness that the wall cavity can accommodate, but not less than ½ inch (12 mm) thick.~~

~~**Exception:** Insulation is not required for the following:~~

- ~~1. Factory installed piping within service water heating equipment tested and rated in accordance with Section 606.4.~~
- ~~2. Piping conveying fluids that is neither heated nor cooled, including cold water supply and natural gas piping.~~
- ~~3. Hot water supply piping exposed under sinks, lavatories and similar fixtures.~~
- ~~4. Hot water distribution piping buried within blown in or sprayed roof/ceiling insulation, such as fiberglass or cellulose, where the insulation completely and continuously surrounds the pipe.~~

Reason: I am proposing to delete this section because its provisions are now included in the 2015 IECC and the 2015 IPC. Proposal CE-271 Part 1 was approved at the Final Comment Hearing in 2013. A coordinating section was approved for inclusion in the IPC. Since the IgCC is an overlay code, there is no longer a need for this section. I urge you to support this proposal. Thank you.

Cost Impact: Will not increase the cost of construction

Removal of this section will not increase the cost of construction since the provisions are included in the IECC.

GEW102-14: 607.6-KLEIN821

GEW103-14

607.6, 607.6.1(New), 607.6.2 (New), Table 607.6.2 (New)

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee

Revise as follows:

607.6 Service water heating system piping insulation. Service water heating system piping that conveys heated water shall be thermally insulated in accordance with ~~Table 606.4~~ either Section 607.6.1 or Section 607.6.2. The insulation requirements of this section shall supersede the insulation requirements of the *International Energy Conservation Code*. Insulation shall be installed in accordance with the insulation manufacturer's instructions. Piping insulation shall be continuous except where the piping passes through a framing member. ~~Where hot water distribution piping is installed within attics and crawlspaces, the insulation shall continue to cover the pipe for a distance not less than 6 inches (152 mm) beyond the building thermal envelope. Where hot water distribution piping is installed within walls, the insulation shall completely surround the pipe with not less than 1 inch (25 mm) of insulation. Where piping is installed in locations subject to freezing temperatures, Section 305.4 of the *International Plumbing Code* or Section P2603.4 of the *International Residential Code*, as applicable, shall apply. Where hot water piping is installed in a wall cavity of insufficient size to accommodate the pipe and insulation levels of Table 606.4, the insulation thickness shall be permitted to have the maximum thickness that the wall cavity can accommodate, but not less than 1/2-inch (12 mm) thick.~~

Exceptions: ~~Piping insulation is~~ shall not be required for the following:

1. ~~Factory-installed piping within service water heating equipment tested and rated in accordance with Section 606.4.~~
2. ~~Piping conveying fluids that is neither heated nor cooled, including cold water supply and natural gas piping. Portions of piping that radiate heat to concrete slabs for the purposes of preventing ice and snow accumulation on the top surface of the slab.~~
3. ~~Hot water supply piping under sinks, lavatories and similar fixtures. Tubing and connectors from the termination of the outlet end of fixture supply piping to a fixture fitting or a water consuming appliance.~~
4. ~~Hot water distribution piping buried within blown-in or sprayed roof/ceiling insulation, such as fiberglass or cellulose, where the insulation completely and continuously surrounds the pipe.~~
4. ~~Valves, pumps, strainers and threaded unions in piping that is 1 inch or less in nominal diameter.~~
5. ~~Piping from user-controlled shower, tub/shower, and tub mixing valves to the water outlets.~~
6. ~~Cold water piping utilized by a demand recirculation water system.~~
7. ~~Tubing from a hot drinking-water dispensing unit to the water outlet.~~

607.6.1 Buried piping. Piping insulated with tube or sheet insulation. Service hot water heating system piping installed within a slab or below grade conveying heated water shall be insulated in accordance with Section 607.6 tube or sheet insulation having a thermal conductivity of not greater than 0.29 and Btu per inch/h×ft²×F[0.42 W/(m×K)]. The wall thickness of the insulation shall be placed within a physically protective, waterproof channel or sleeve having internal dimensions large enough so that the piping and insulation can be removed and replaced, and maintain its dimensional integrity during and after construction. ~~not less than the diameter of the pipe that is being insulated except that a wall thickness greater than 2 inches (50.8 mm) shall not be required.~~

Exception: For piping other than that located under building slabs, insulation is not required where the insulation manufacturer stipulates that the pipe insulation will maintain its insulating

value in underground applications in damp soil where installed in accordance with the manufacturer's instructions.

607.6.2 Piping insulated with building thermal envelope insulation. Service water heating system piping conveying heated water shall be insulated with building thermal envelope insulation. The minimum insulation R-value shall be not less than that indicated in Table 607.6.2. The required insulation shall completely surround the piping.

**TABLE 607.6.2
MINIMUM BUILDING THERMAL ENVELOPE R-VALUE FOR
INSULATING PIPE AND TUBING^a**

<u>NOMINAL PIPE OR TUBE SIZE (Inch)</u>	<u>MINIMUM INSULATION R-VALUE</u>
$\leq 3/8$	<u>R-1.6</u>
$> 3/8 \leq 1/2$	<u>R-2.1</u>
$> 1/2 \leq 3/4$	<u>R-3.1</u>
$> 3/4 \leq 1$	<u>R-4.2</u>
$> 1 \leq 1\frac{1}{2}$	<u>R-6</u>
$> 1\frac{1}{2} \leq 2$	<u>R-8</u>
> 2	<u>R-8</u>

For SI: 1 inch = 25.4 mm

a. The minimum required thickness of R-value rated insulation to be installed shall be the R-value in this table divided by the published R-value/inch of the insulation to be used.

Reason: The language of the section is very confusing and desperately needs repair and clarification. The main intent of the *existing* section is two-fold: 1) provide reasonable insulation thicknesses for smaller diameter piping utilizing a simple "wall thickness of insulation = size of pipe" approach and 2) provide an alternate way of insulating piping using the building thermal envelope insulation that is already being installed for insulating the building. The existing language is unclear and vague resulting in confusion on what the section requires and allows. Also, the *existing* language (poorly) attempts to cover the topic of protection of piping against freezing temperatures that is not within the scope of this code (the IPC addresses protection of piping against freezing).

The proposed modifications to this section are:

The reference to Table 606.4 (under the HVAC piping insulation section) was removed because it is poor code practice to use tables from other "unrelated" sections of the code for another purpose. The table in the other section could be changed without the knowledge that another section in the code refers to that table. This can lead to future problems in the code. Rather than make a new table for this section with one row ("hot water"), the requirement is best stated in code language that is being placed in new subsection 607.6.1. Another new subsection (Section 607.6.2) is added for clarifying the requirements for the alternate way to insulate piping by "nesting" or covering the piping with the building thermal envelope insulation that is already being installed for insulating the building. Discussions of new subsections 607.6.1 and 607.6.2 are provided later in this reason statement.

The new language "The insulation requirements of this section shall supersede the insulation requirements of the *International Energy Conservation Code*." may, at first reading, seem to imply that the insulation requirements of this section are more stringent than what is in the IECC. This is *not* necessarily the case. But don't throw out this proposal because of this perceived "reduced stringency" because the *existing* reference to Table 606.4 *already* forces the reader to address and resolve what appears to be conflict between the insulation requirements of the IECC and this section. For example, Table C403.2.8 of the 2012 IECC indicates the insulation wall thickness for 1 inch and smaller piping (with 105F-140F fluid temperature) to be 1 inch. So, if you have a 1/2 inch pipe, the insulation wall thickness needs to be 1 inch. A 3/8 inch pipe? 1 inch insulation wall thickness. IgCC Section 607.6 requires not less than a 1:1 ratio of insulation wall thickness to pipe diameter (i.e. "wall thickness of insulation = size of pipe"). Therefore, a 1/2 inch nominal size pipe is required to have 1/2 inch wall thickness insulation. A 3/8 inch nominal size pipe is required to have 3/8 inch wall thickness insulation. But which code's insulation thickness requirements should prevail? To answer this question, the reader must keep in mind that the intent of the IgCC is to be an overlay code to the other I-codes to "reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and the building occupants". This section's *existing* piping insulation requirements (as opposed to the IECC's insulation requirements) are intended to prevail because:

1) Thick insulation for small diameter piping creates difficulty in getting the insulated piping (given the piping "crossover" issues) into a typical 3 1/2 inch thick wall. To accommodate the thick insulation, walls need to be deeper which means deeper framing members or "furring out" of 3 1/2 inch walls. Thicker walls (=more costly framing materials) less usable building spacelarger buildings for same usable floor areaè less "green".

2) The insulation provisions of the IECC do not consider the need for hot water piping diameters that are smaller than ½ inch nominal. Small diameter hot water piping is needed to reduce the amount of time (and reduce the amount of water waste) waiting for hot water to arrive at the point of use. Piping as small as 1/4 inch nominal could be necessary to accomplish this. Tube type insulation products with 1 inch wall thickness are not currently available for nominal pipe diameters smaller than ½ inch. It just doesn't make practical sense to insulate such small pipe diameters with the same insulation thickness that also serves a ¾ inch nominal pipe. Less insulation thickness for the smaller pipe diameters is more "green" because the thicker insulation is just not necessary given the limited amount of time that these small pipes are conveying hot water. The "energy savings" of thicker insulation is negligible/insignificant as compared to the real waste of energy and water caused by poor hot water distribution system design. The bottom line is: don't use more insulating materials than the application actually warrants! The fact that there is some level of insulation on the piping as opposed to no insulation on the piping is where the real energy savings occurs. In these small pipe diameters, where the flow of hot water is often intermittent, the insulation thickness is a very small part of energy savings.

For these reasons, the intent of this section in the 2012 IgCC was always to "override" the insulation requirements of the IECC. The statement "The insulation requirements of this section shall supersede the insulation requirements of the *International Energy Conservation Code*." is necessary to make it clear that the IgCC requirements in this section are not to be "trumped" by the IECC. Note that *this is not a new requirement* but a necessary clarification of what is already intended by Section 607.6 of the 2012 IgCC.

The new language "Insulation shall be installed in accordance with the insulation manufacturer's instructions." is a simple but meaningful addition. In applications where tube-style insulation is installed, some installers try to "cheat" by not taping/sealing joints and by not covering fittings properly. This sloppy practice defeats the purpose of installing the insulation in the first place. Insulation manufacturer's installation instructions are specific about how to achieve the rated insulation value from their products. It is absolutely critical that the instructions be followed.

The new language "Piping insulation shall be continuous except where the piping passes through a framing member." answers the significant question about whether the insulation needs to be continuous through framing members. Realize that even for a small diameter pipe such as ½ inch nominal size (about 5/8 inch actual OD), the outside diameter of the required insulation for the pipe is 1 5/8 inches. This requires a 1 ¾ inch diameter hole to be bored through wood framing and the webs of light frame steel framing. This weakens the framing member and often requires "doubling" of framing members or increasing the depth (thickness) of walls so that the deeper framing members are less affected by such a large hole. This is unnecessary as the short length of uninsulated pipe within the thickness of the "web" of the framing member will have negligible/insignificant heat loss, especially if attention is paid to assuring that the adjacent insulation is "butted-up to" the face of the "web" of the framing member.

The new language "Where piping is installed in locations subject to freezing temperatures, Section 305.4 of the *International Plumbing Code* shall apply." replaces the two previous sentences in the existing section. The original author's intent was to try to address situations where the water piping was installed in an attic, crawl space or exterior wall where one "side" of the insulated piping could be exposed to freezing temperatures (outdoor temperature). The original author's language for making sure that not less than 6 inches of building thermal envelope insulation covers the pipe where it is located in an attic or crawl space; and making sure that the piping in an [exterior] wall has at least 1 inch insulation around the pipe are merely "guidelines" that might only work for some climates. For example, those requirements *might* work for buildings in Texas but not work for buildings in North Dakota. This section in the IgCC needs to be concerned *only* with efficient use of insulation to maintain water temperature within the pipe, given that the temperature on the outside of the insulation around the pipe is somewhat above freezing. Section 305.4 of the IPC addresses the issue about protection of piping from freezing and that is all that needs to be said. Protection of piping from freezing is a design decision that varies with the geographic region that the building is located in. In many large commercial buildings where outdoor freezing temperatures could occur, piping is simply not located in "unconditioned areas" of the building. In smaller commercial buildings, builders and code officials "know" from extensive experience in each geographic region where not to locate piping and how to "protect" piping against freezing. For example, locating water piping in attics of buildings in North Dakota just isn't done. But doing so in southern Florida is an accepted practice. This IgCC section should not attempt to address the freezing temperature issue (in the way that it has) because doing so seems to imply that this will work for ALL regions. This could lead to disastrous results. It is not a subject that needs to be addressed in the IgCC. Let the plumbing code deal with the issue as it has adequately done so for many years.

A number of the exceptions were clarified and added:

Existing exception 2 does not make sense. The section is about service water heating system piping so there is no need to discuss fluids neither heated or cooled, or natural gas piping. The main section has been revised to simply say that the section is about insulating piping conveying heated water. New exception language was put in place to cover ice and snow melt piping under slab-on-grade concrete slabs (as the IECC and the IgCC consider hot water for snowmelt systems as service heating water). Obviously, piping in those applications should *not* be insulated as the purpose of the piping is to give off heat to the concrete. (Piping for radiant heating for *comfort* is *not* covered under service water heating systems.)

Exception 3 is reworded to be more specific about what exposed piping is being discussed. Basically, the tubing or connectors from the fixture back to the outlet end termination of the fixture supply pipes do not have to be insulated as it would be much too difficult to install insulation on these small connectors and tubes – the heat loss from these small diameter tubes and connectors into a conditioned space is negligible/insignificant. Why complicate final plumbing connections and future fixture service work by requiring insulation that has no real benefit?

The purpose of existing exception 4 is to not require service water heating system piping to be insulated with pipe insulation where there is going to be building thermal envelope insulation installed where the pipe is located. The existing language of exception 4 is extremely vague about what constitutes "buried". Does that mean one inch or 6 inches of insulation around the piping? The phrase "hot water distribution" might lead a reader to believe that only *hot water* piping (IPC-defined as equal to, or greater than 110F) is permitted to use the "buried in blown-in or sprayed roof/ceiling fiberglass or cellulose insulation method". Note that first sentence of Section 607.6 was revised to clarify that the piping is conveying *heated water* because if water is heated, then energy can be lost from the piping on its way to the point of use. While the energy lost from heated water of a low

temperature is minimal, the point is that *the desired water temperature might not ever reach the point of use if the piping was not insulated*. Because of the vagueness of existing exception 4, the exception was eliminated and those concepts put into new sections 607.2.1 and 607.2.2 (which will be discussed later in this reason statement).

New exception 4 provides relief from insulating “bulky” components in smaller diameter (1 inch or less) piping. The heat loss from these items is negligible/insignificant and it is not worth the time spent trying to insulate such components. This is simply a matter of practicality. Is it really necessary to insulate a shower mixing valve given the complexity of doing so compared to the limited amount of time that the mixing valve actually conveys heated water?

New exception 5 provides relief from insulating piping from the user-controlled valves indicated. Although a simple shower riser might not be too difficult to insulate, other piping for multiple shower heads, spray ports, transfer valves, etc. can be complex and the area that they are located in, congested. It just isn't worth the time and effort for this small amount of small diameter piping.

New exception 6 is simple to understand if one understands the type of demand recirculation system that uses a cold water pipe (near or at a fixture) for the return of heated water in a cold water pipe back to the water heater. The water pumped into a cold water line is really never “hot” (it's barely luke warm) and the only purpose for moving the “hot” water into the cold water line is to provide a return path back to the water heater. The barely luke warm water being returned serves no other purpose. There is no need to insulate cold water lines used for such purpose. It is actually better that the cold water pipe gives off some heat so that the cold water flow to the fixture is barely warm for only a second or two, depending on the fixture flow rate.

New exception 7 clarifies that tubing from under counter “insta-hot” units (used for making instant coffee and package soup mixes) do not need insulated. The tubing is so small and short that any heat lost is negligible/insignificant as compared to the heat loss from the unit itself.

New Section 607.6.1 is *not* adding a new set of requirements to the code. This new section simply puts into text, what the existing section's reference to Table 606.4 was trying to accomplish. The use of text instead of a table for these requirements is cleaner and straight forward. Section 607.6.1 provides the insulation requirements for where tube-type and sheet insulation is installed on piping (sheet product being used for large pipe diameters). The material is the familiar closed-cell-expanded-foam tube and sheet, and fiberglass insulation tube and sheet, that are commonly available to the plumbing/insulation trades. The thermal conductivity value of 0.29 Btu per inch/h•ft²•F covers the largest value of those two materials at the maximum temperature that would be used for service hot water. Again, the 1:1 insulation-wall-thickness-to-nominal-pipe-diameter concept is *not* new – this is exactly what the existing section language required.

New Section 607.6.2 provides the insulation requirements for where building thermal envelope insulation (such as fiberglass batts, blown-in fiberglass, sprayed-in cellulose, sprayed (expanding) foams, polystyrene board or any one of a number of insulating products) is used for insulating buildings. Although this section is new, the concept was what was intended in the existing language of Section 607.6 of the 2012 IgCC. But the existing language did not make clear what was really intended. This new section adds to the existing concept by providing prescriptive language that can be easily understood given the variety of applications that will be encountered in the built environment.

The required R-values in Table 607.6.2 reflect the same insulating effect achieved as if the piping was insulated in accordance with minimum requirements of Section 607.6.1. These R-values come from the published data of one manufacturer of closed-cell-expanded-foam sheet material...the same material and density that is used to make the familiar closed-cell-expanded-foam tube [ref: Armacell technical bulletin #004]. This R-value information provides some basis for determining an equivalency between a pipe insulated with tube-type pipe insulation and a pipe that is insulated by the virtue of being “buried” in building thermal envelope insulation that is already required for the building. It really isn't important that complex mathematics and analysis are used to *exactly* determine this equivalency because in practice, the piping will be covered with far more insulation than is needed in most of the circumstances. All Table 607.6.2 does is establish a “minimum cover” dimension. Because building thermal envelope insulation is available in many forms, each having different R-values for a given thickness, Table 607.6.2 provides the minimum R-value so that along with table footnote a, the required minimum thickness can be determined for the type of building thermal envelope insulation to be installed.

For example, a 3/8 inch pipe is in a 3 1/2 inch deep wall that will require R-13 insulation. Fiberglass batt insulation is chosen that is rated for R-13 for a 3 1/2 inch installation depth. The R-value *rating* per inch of this product would be 13/3.5=3.7 per inch. The minimum R-value in Table 607.6.2 for 3/8 inch nominal size pipe is R-1.6. Using footnote a, the minimum thickness (cover) of this fiberglass insulation on the pipe must be not less than 1.6/3.7 = 0.43 inch. The plumbing installer then knows he has to locate the 3/8 inch pipe no closer to than 0.43 inch to either face of the wall. The installer will most likely round this number up to, say, 1/2”, and install the piping in the wall cavity accordingly to accommodate the insulators work of “nesting” the piping into the insulation as the fiberglass batts are installed. There is no extra work for the insulators as they have to place insulation around piping and other items anyhow. And the piping doesn't require a layer of tube-type insulation before building thermal envelope insulation is installed (which eliminates redundancy of insulation materials).

As stated previously, in the majority of circumstances when using the method of Section 607.6.2, the piping will, overall, be covered with far more insulation than what Table 607.6.2 requires. Even though the insulation thickness from the outside of the pipe to the face of the wall might only be 1/2 inch, in a direction perpendicular to that, there will be many inches of insulation against the pipe. Table 607.6.2 is not really intended to be used for trying to create a “tube-type pipe insulation effect” using building thermal envelope insulation. For instance, someone cutting a strip of fiberglass insulation and wrapping it around a pipe to serve as the required pipe insulation. This practice would not benefit from the added insulating value from greater insulation thickness that would be present in a “nested into the cavity insulation” situation. The entire premise of developing the R-value equivalency using an approximation (and not rigid computational methods) depends on a greater thicknesses of insulation being present around most of the circumference of the piping. As such, it is not necessary to insulate over or through support clamps.

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public comments. Related documentation and reports are posted on the SEHPCAC website at:
<http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction

Providing for alternate methods and more efficient methods for insulating piping will, cost less than the methods that are required by the IECC.

GEW103-14: 607.6-THOMPSON442

GEW104-14

607.6.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee

Revise as follows:

607.6.1 Buried Underground and below slab piping. ~~Service hot water~~ Insulated piping that is located under a concrete slab-on-grade floor or that is buried underground shall be installed in a waterproof conduit. The ends of the conduit shall terminate above the floor or above grade. piping installed within a slab or below grade shall be insulated in accordance with Section 607.6 and shall be placed within a physically protective, waterproof channel or sleeve having internal dimensions large enough so that the piping and insulation can be removed and replaced, and maintain its dimensional integrity during and after construction.

Exception: For underground insulated piping not other than that located under building slabs, insulation a waterproof conduit is not required for the piping where the insulation manufacturer stipulates indicates that the pipe piping insulation will retain maintain it's the design insulating value in underground damp soil applications in damp soil and where the insulated piping is installed in accordance with the insulation manufacturer's instructions.

Reason: The requirement for having insulated piping *removable* from the waterproof conduit does not save energy and is not a 'green' practice. It only serves to make the installation of the piping more expensive. The building industry has been burying millions of feet of service water heating system piping and none of it is removable because it doesn't need to be. If the type of piping is chosen correctly for the application and the design parameters for use of the piping are followed, the piping installation is a permanent installation. Yes, there might be some extremely isolated cases where piping might require repair or replacement but potential for that happening is the same for piping located anywhere in a building (above or below ground) whether the piping is hot or cold. The removability requirement is not feasible for large sizes or rigid types of piping. It is clear that the author of this section was only thinking about small diameter flexible tubing in a single family home application. The removability requirement is just not feasible for the vast majority of applications.

The exception was reworked because the wording didn't make sense: "insulation is not required where the insulation manufacturer..." . A few words were changed/added to make the exception read with more clarity.

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Cost Impact: Will not increase the cost of construction.

GEW104-14: 607.6.1 #1-THOMPSON415

GEW105-14

607.6.1

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Revise as follows:

607.6.1 Buried piping. Service hot water piping installed within a slab or below grade shall be insulated in accordance with Section ~~607.6~~ C404.5 of the *International Energy Conservation Code* and shall be placed within a physically protective, waterproof channel or sleeve having internal dimensions large enough so that the piping and insulation can be removed and replaced, and maintain its dimensional integrity during and after construction.

Exception: For piping other than that located under building slabs, insulation is not required where the insulation manufacturer stipulates that the pipe insulation will maintain its insulating value in underground applications in damp soil where installed in accordance with the manufacturer's instructions.

Reason: The purpose of this proposal is to correlate the language with provisions that were approved for the 2015 IECC-CE.

Cost Impact: Will not increase the cost of construction These provisions were already in the 2012 IgCC.

Analysis: The International Energy Conservation Code section C404.5 referenced in the text of this proposal are section numbers for the 2012 Edition. Because of significant changes approved for the 2015 IECC, the section number for the 2015 Editions will be C404.4.

GEW105-14:607.6.1 #1-KLEIN966

GEW106-14

607.6.1

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Revise as follows:

607.6.1 Buried piping. ~~Service-hot~~ Heated water piping installed within or under a slab or buried below grade shall be insulated in accordance with Section ~~607.6~~ C404.5 of the *International Energy Conservation Code* and shall be placed within a physically protective, waterproof channel or sleeve having internal dimensions large enough so that the piping and insulation can be removed and replaced, and maintain its dimensional integrity during and after construction.

Exception: For piping other than that located within or under building slabs, ~~insulation~~ a physically protective, waterproof channel or sleeve is not required where the insulation manufacturer stipulates that the pipe insulation will maintain its insulating value in underground applications in damp soil where installed in accordance with the manufacturer's instructions.

Reason: The primary purpose of this proposal is to correlate the language with provisions that were approved for the 2015 IECC-CE. In addition, the language in the exemption has been corrected. Heated water piping still needs to be insulated; in some cases protective sleeving will not be required.

Cost Impact: Will not increase the cost of construction. These provisions were already in the 2012 IgCC.

Analysis: The International Energy Conservation Code section C404.5 referenced in the text of this proposal are section numbers for the 2012 Edition. Because significant changes were approved for the 2015 IECC, the section number for the 2015 Edition will be C404.4.

GEW106-14: 607.6.1 #2-KLEIN1181

GEW107-14

607.6.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee

Revise as follows:

607.6.1 Buried piping. Service hot water heating piping installed within a slab or below grade shall be insulated in accordance with Section 607.6 and shall be placed within a physically protective, waterproof channel or sleeve having internal dimensions large enough so that the piping and insulation can be removed and replaced, and maintain its dimensional integrity during and after construction.

Exception: ~~For piping other than that located under building slabs, insulation~~ A waterproof conduit shall ~~not be~~ ~~is not~~ required where the insulation manufacturer stipulates that the pipe insulation will maintain its insulating value in underground applications in damp soil and where the insulation is installed in accordance with the manufacturer's instructions.

Reason: Another SEHPCAC proposal for this section addresses the issue of removability of insulated piping from the waterproof conduit. This proposal addresses the exception that allows omission of the waterproof conduit for insulated piping.

The exception only covers underground piping that is not located under [concrete] slabs. Logically, piping that is under slabs is much more "protected" from moisture (rainwater, snowmelt) so the exception should apply to any insulated piping regardless of whether it is between buildings (subject to rainwater and snowmelt) or under a building (below a slab).

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW107-14:607.6.1 #2-THOMPSON418

GEW108-14

607.7

Proponent: Gary Klein, Affiliated International Management, LLC, representing self
(gary@aim4sustainability.com)

Delete without substitution:

~~**607.7 Circulating hot water systems.** Controls that allow continuous, timer, or water temperature-initiated (aquastat) operation of a circulating pump are prohibited. Gravity or thermosyphon circulation loops are prohibited. Pumps on circulating hot water systems shall be activated on demand by either a hard-wired or wireless activation control of one of the following types:~~

- ~~1. A normally open, momentary contact switch.~~
- ~~2. Motion sensors that make momentary contact when motion is sensed. After the signal is sent, the sensor shall go into a lock-out mode for not less than 5 minutes to prevent sending a signal to the electronic controls while the circulation loop is still hot.~~
- ~~3. A flow switch.~~
- ~~4. A door switch.~~

~~The controls for the pump shall be electronic and operate on the principal of shutting off the pump with a rise in temperature. Electronic controls shall have a lock-out to prevent operation at temperatures greater than 105°F (41°C) in the event of failure of the device that senses temperature rise. The electronic controls shall have a lock-out mode for not more than 5 minutes that prevents extended operation of the pump if the sensor fails or is damaged.~~

Reason: I am proposing to delete this section because its provisions are now included in the 2015 IECC and the 2015 IPC. Proposal CE-279 Part 1 was approved at the Final Comment Hearing in 2013. A coordinating section was approved for inclusion in the IPC. Since the IgCC is an overlay code, there is no longer a need for this section. I urge you to support this proposal. Thank you.

Cost Impact: Will not increase the cost of construction.

The discussion regarding the impact on the cost of construction was heard during the IECC hearings.

From CE-279's reason statement (covering both circulation and heat trace systems): The proposal does not require either circulation or heat trace; however if either is selected, it clarifies the requirements for installation. Most recirculation systems today are installed with some form of control, usually a timer, a bandwidth thermostat (aquastat) or both. Some come with more sophisticated controls, such as programmable or are connected to an energy management system. In some cases, switching from these control strategies to demand activated controls will cost less. In other cases, the demand-activated controls will cost more.

Deleting this section will not increase the cost of construction.

GEW108-14: 607.7-KLEIN819

GEW109-14

607.7

Proponent: Greg Towsley, Grundfos, representing Grundfos (gtowsley@grundfos.com)

Revise as follows:

607.7 Circulating hot water systems. ~~Controls that allow continuous, timer, or water temperature-initiated (aquastat) operation of a circulating pump are prohibited. Gravity or thermosyphon circulation loops are prohibited. Pumps on circulating hot water systems shall be activated on demand by either a hard-wired or wireless activation control of one of the following types:~~

- ~~1. A normally open, momentary contact switch.~~
- ~~2. Motion sensors that make momentary contact when motion is sensed. After the signal is sent, the sensor shall go into a lock-out mode for not less than 5 minutes to prevent sending a signal to the electronic controls while the circulation loop is still hot.~~
- ~~3. A flow switch.~~
- ~~4. A door switch.~~

~~The controls for the pump shall be electronic and operate on the principal of shutting off the pump with a rise in temperature. Electronic controls shall have a lock-out to prevent operation at temperatures greater than 105°F (41°C) in the event of failure of the device that senses temperature rise. The electronic controls shall have a lock-out mode for not more than 5 minutes that prevents extended operation of the pump if the sensor fails or is damaged.~~

Controls for circulating hot water system pumps shall comply with the requirements of the *International Energy Conservation Code*.

Reason: The International Energy Conservation Code (IECC) was revised in Atlantic City, NJ in October 2013 to include code language that is equal or similar to the above but less prescriptive, allowing for newer technology to control the pumps upon demand for hot water. No new or additional wording is required beyond the language of the IECC.

Cost Impact: Will not increase the cost of construction. No cost impact as the language of the IECC is equal to or similar to that which is being deleted.

GEW109-14: 607.7-TOWSLEY563

GEW110-14

607.7

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee

Revise as follows:

607.7 Circulating ~~hot~~ heated water systems for service water heating systems. ~~This section shall apply only to systems that circulate heated water from service water heating equipment to plumbing fixtures. Circulation shall be by one or more pumps. Gravity or thermosyphon circulation systems loops are shall be prohibited. Controls that allow~~ Continuous, timer, or water temperature-initiated (aquastat) circulating pump operation of a circulating ~~are~~ shall be prohibited. ~~The pumps on circulating water systems hot water systems~~ shall be activated on demand by either a hard-wired or wireless activation control of one of the following types:

1. A normally open, momentary contact switch.
2. Motion sensors that make momentary contact when motion is sensed. After the signal is sent, the sensor shall go into a lock out mode for not less than 5 minutes to prevent sending a signal to the electronic controls while the circulation loop is still hot.
3. A flow switch.
4. A door switch.

The controls for the pump shall be electronic and shall operate on the principal of shutting off the pump with a rise in temperature. Electronic controls shall have a lock-out to prevent operation at water temperatures greater than 105°F (41°C) in the event of failure of the device that senses temperature rise. The electronic controls shall have a lock out mode for not more than 5 minutes that prevents extended operation of the pump if the sensor fails or is damaged.

Reason: The existing section fails to address which circulating pumps that the requirements relate to. This section is not intended to cover circulating pumps for hot water systems for comfort heating or for snowmelt systems but the language isn't specific. The use of the term "are" is not appropriate because the sentence with "are" is just a statement. Changing "are" to "shall" makes the sentence a mandatory command. Aquastat is a registered trademark of Honeywell. Trademarked names and words in parenthesis must not be used in code text. The section is reworded to be clear.

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Cost Impact: Will not increase the cost of construction.

GEW110-14: 607.7-THOMPSON419

GEW111-14

607.7

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

607.7 Circulating hot water systems. Controls that allow continuous, timer, or water temperature-initiated (aquastat) operation of a circulating pump are prohibited. Gravity or thermosiphon circulation loops are prohibited. Pumps on circulating hot water systems shall be activated on demand by either a hard-wired or wireless activation control of one of the following types:

1. A normally open, momentary contact switch.
2. Motion sensors that make momentary contact when motion is sensed. After the signal is sent, the sensor shall go into a lock out mode for not less than 5 minutes to prevent sending a signal to the electronic controls while the circulation loop is still hot.
3. A flow switch.
4. A door switch.

The controls for the pump shall be electronic and operate on the principal of shutting off the pump with a rise in temperature. Electronic controls shall have a lock-out to prevent operation at temperatures greater than 105°F (41°C) in the event of failure of the device that senses temperature rise. The electronic controls shall have a lock out mode for not more than 5 minutes that prevents extended operation of the pump if the sensor fails or is damaged.

Exception: Group I-2 Condition 2 and ambulatory care facilities shall not be required to comply with this section.

Reason: The "Guidelines for Design and Construction of Health Care Facilities" from the Facility Guidelines Institute (FGI) require a continuous circulating hotwater system in hospitals and ambulatory care facilities. This document is adopted by most states and used as licensing requirements for these facility types. It is also used by third-party healthcare accreditation companies, such as the Joint Commission. Restricting it here would be a potential rules conflict when states adopt both IgCC and FGI. Additionally, maintaining hot and cold water temperatures within prescribed ranges throughout a hospital water system has been shown to reduce the proliferation of Legionella. Cold water should be distributed and delivered at temperatures below 77°F (25°C). If cold water temperatures exceed 77°F (25°C) in any part of the system, the potential for proliferation of Legionella increases significantly. Hot water should be consistently above 130°F (55°C) throughout heating and storage vessels. If temperatures cannot be maintained and documented to be consistently at or above 130°F(55°C) —e.g., due to stratification—then hot water should be stored at or above 140°F (60° C). However, storage at 140°F (60°C) does not guarantee Legionella control in tanks, especially if there are significant issues with stratification or residence time. Not allowing a circulating hot water system will reduce the ability to control the water temperature exposing the at risk population within hospitals to life threatening bacteria.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction.

GEW111-14: 607.7-PAARLBERG647

GEW112-14

608

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner (craig.conner@mac.com)

Delete without substitution:

~~SECTION 608 BUILDING ELECTRICAL POWER AND LIGHTING SYSTEMS~~

Reason: Most of the provisions are already in the IECC.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GEW112-14: 608-KLEIN1212

GEW113-14

608.1, 608.1.1, 608.1.2, 608.1.3

Proponent: Glenn Heinmiller, representing International Association of Lighting Designers
(glenn@lampartners.com)

Revise as follows:

608.1 General. Where buildings are designed using the prescriptive-based compliance path in accordance with Section 601.3.2, building electrical power and lighting systems shall comply with the provisions of the *International Energy Conservation Code* and the provisions of Section 608. Occupant sensor controls, time switch controls, and daylight responsive controls required by this section shall comply with Section C405.2 of the International Energy Conservation Code. Daylight zones shall be determined in accordance with Section C405.2 of the International Energy Conservation Code.

~~**608.1.1 Occupant sensor controls.** Occupant sensor controls shall comply with Section C405.2 of the *International Energy Conservation Code*.~~

~~**608.1.2 Time switch controls.** Time switch controls shall comply with Section C405.2 of the *International Energy Conservation Code*.~~

~~**608.1.3 Automatic daylight controls.** Automatic *daylight controls* shall comply with Section C405.2 of the *International Energy Conservation Code*.~~

Reason: There is no need to have three different subsections when these requirements can be written into one sentence.

Now that the daylighting provisions in the IECC have been updated by CE294 there is no need to retain a separate set of definitions for daylight zones / daylit areas and automatic daylight controls / daylight responsive controls in the IgCC.

Cost Impact: Will not increase the cost of construction.

GEW113-14: 608.1-HEINMILLER613

GEW114-14

608.2, 608.2.1

Proponent: Glenn Heinmiller, representing International Association of Lighting Designers
(glenn@lampartners.com)

Revise as follows:

608.2 Sleeping unit controls. Sleeping units in Group R-1 and R-2 occupancies shall have a master control device that is capable of automatically switching off all installed luminaires and switched receptacles within 20 minutes after all occupants have left the room. ~~an automatic control system or device that shuts off permanently wired luminaires and switched receptacles, except those in bathrooms, within 30 minutes of the unit being vacated.~~

Exception: ~~Sleeping unit controls are not required in sleeping units where permanently wired luminaires and switched receptacles, except those in bathrooms, are connected to a~~ Luminaires and switched receptacles controlled by captive key controls.

608.2.1 Sleeping unit bathroom controls. Permanently wired luminaires located in bathrooms within sleeping units in Group R-1 and R-2 occupancies shall be equipped with occupant ~~sensors~~ sensor controls that require manual intervention to energize circuits.

Exception: ~~Not more than 5 watts of lighting in each bathroom shall be permitted to be connected to the captive key control at the main room entry instead of being connected to the occupant sensor control.~~ Five watts or less of lighting capacity in each bathroom shall not be required to be controlled by the occupant sensor control where such lighting is connected to the master control device for the sleeping unit.

Reason: This proposal incorporates language from CE299 AM so that IgCC 2015 will not conflict with IECC 2015 requirements for "hotel and motel sleeping units and guest suites".

Section 608.2 is still necessary because it is more expansive than the IECC requirements, since it is applicable to all sleeping units in R-1 and R-2 occupancies, not just "hotel and motel sleeping units and guest suites". Furthermore, the IgCC requires that bathrooms within these sleeping units incorporate occupant sensors, which is not a requirement in the IECC.

Cost Impact: Will not increase the cost of construction.

GEW114-14: 608.2-HEINMILLER614

GEW115-14

608.3

Proponent: Glenn Heinmiller, representing International Association of Lighting Designers
(glenn@lampartners.com)

Revise as follows:

608.3 Interior light reduction controls. Occupant sensor controls shall be provided to automatically reduce connected lighting power by not less than 45 percent during periods when occupants are not present in the following locations:

1. Corridors and enclosed stairwells.
2. ~~Storage and stack areas not open to the public; and~~
3. Parking garages.

Exception: Automatic power reduction is not required for the following:

1. Where occupant sensor controls are overridden by time switch controls that keep lights on continuously during peak occupancy periods.
2. Means of egress lighting required by the *International Building Code* or the *International Fire Code*.

Reason: Storage areas are already required to have occupant sensor control by the IECC.

Cost Impact: Will not increase the cost of construction.

GEW115-14: 608.3-HEINMILLER672

GEW116-14

202, 608.5

Proponent: Glenn Heinmiller, representing International Association of Lighting Designers (glenn@lampartners.com); Jim Edelson, New Buildings Institute, representing New Buildings Institute

Revise definitions as follows:

DAYLIGHT RESPONSIVE CONTROL. A device or system that provides automatic control of electric light levels based on the amount of daylight in a space.

DAYLIGHT ZONE. That portion of a building's interior floor area that is regularly illuminated by natural light.

Revise as follows:

608.5 Automatic Daylight responsive controls. Automatic daylight controls shall be provided in daylit areas complying with Section 808.3.1 or Section 808.3.2 to control the lights serving those areas. General lighting in a sidelighting daylit area that is within one window head height shall be separately controlled by automatic daylight controls.

Exception: Automatic daylight controls are not required for the following spaces and equipment:

1. Toplighting daylit areas where the skylight is located in a portion of the roof that is shaded during the peak sun angle on the summer solstice by permanent features of the building or by permanent features of adjacent buildings.
2. Sidelighting daylit areas where the fenestration is located in an obstructed exterior wall that does not face a public way or a yard or court complying with Section 1206 of the International Building Code or where the distance to any buildings, structures, or geological formations in front of the wall is less than two times the height of the buildings, structures, or geological formations.
3. Daylit areas served by less than 90 watts of lighting.
4. Spaces where medical care is directly provided.
5. Spaces within dwelling units or sleeping units.
6. Lighting required to comply with Section C405.2.3 of the *International Energy Conservation Code*.

Daylight responsive controls shall be provided to control the electric lights within daylight zones in the following spaces:

1. Spaces having a total of more than 90 watts of general lighting within sidelight daylight zones. General lighting does not include lighting that is required to have specific application control in accordance with Section C405.2 of the *International Energy Conservation Code*.
2. Spaces having a total of more than 90 watts of general lighting within toplight daylight zones.

Exceptions: Daylight responsive controls are not required for the following:

1. Spaces in health care facilities where patient care is directly provided.
2. Dwelling units and sleeping units.
3. Lighting that is required to have specific application control in accordance with Section C405.2 of the *International Energy Conservation Code*.
4. Sidelight daylight zones on the first floor above grade in Group A-2 and Group M occupancies.

Reason: The 2012 IgCC included a mandatory requirement for automatic control of electric lights in spaces that received sufficient daylight so that electric lights could be regularly turned off. There was no similar requirement in the 2012 IECC. However, with the approval of CE294 AMPC1/3, the 2015 IECC will now have a similar requirement.

This proposal conforms the language of the IgCC to CE294 AMPC1/3 so that a separate determination of daylight-related controls requirements is not necessary under the IgCC. It also sets the bar higher in the IgCC from an efficiency standpoint by requiring that daylight responsive controls be provided in daylight zones with at least 90 watts of lighting, compared to 150 watts in the IECC.

Definitions are revised to match IECC-2015.

Cost Impact: Will not increase the cost of construction.

GEW116-14: 608.5-HEINMILLER616

GEW117-14

608.6

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

608.6 Plug load controls. Receptacles and electrical outlets in the following spaces shall be controlled by an occupant sensor or time switch as follows:

1. In ~~Group B~~ office spaces without furniture systems incorporating wired receptacles, not less than one controlled receptacle shall be provided for each 50 square feet (4.65 m²).
2. In ~~Group B~~ office spaces with furniture systems incorporating wired receptacles, not less than one controlled circuit shall be provided at each electrical outlet used for powering furniture systems.
3. In classrooms in Group B and Group E occupancies, not less than four controlled receptacles shall be provided in each classroom.
4. In copy rooms, print shops, and computer labs, not less than one controlled receptacle shall be provided for each data jack.
5. In spaces with an overhead cabinet above a counter or work surface, not less than one controlled receptacle shall be provided for each work surface.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Office spaces according to the IBC are Group B occupancies even when they are an accessory use of a building. According to Section 508 of the IBC, accessory uses are classified according to their use. Therefore the management offices at a school, retail store, factory or theater will be classified as Group B. Therefore stating Group B office space is redundant. In comparison, classrooms mentioned in item 3 can be Group B, Group E or Group A. Currently the code doesn't regulate the receptacles in a Group A classroom and therefore having Group B and Group E in item 3 is not redundant information and should remain.

Cost Impact: Will not increase the cost of construction. The change is editorial and will not affect where the regulation is applied.

GEW117-14: 608.6-THOMPSON571

GEW118-14

608.7

Proponent: Glenn Heinmiller, representing International Association of Lighting Designers
(glenn@lampartners.com)

Revise as follows:

608.7 Fuel gas lighting systems. Fixtures that generate illumination by combustion of fuel gas shall be included in lighting power calculations required under ~~Sections C405.5 and C405.6~~ Section C405 of the *International Energy Conservation Code* by converting the maximum rated Btu/h of the luminaire into watts using Equation 6-5.

Wattage Equivalent = Maximum btu/h rating of the fuel gas lighting system divided by 3.413.

Equation 6-5

~~**Exception:** Fuel gas lighting at historic buildings in accordance with Section C101.4.2 of the *International Energy Conservation Code* is not included in the calculation.~~

Reason: The Section reference is made less specific.

The exception is no longer necessary. CE7 AMPC states that if “a report has been submitted to the code official and signed by a registered design professional, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the building,” then that portion of the building system would not be required to comply with efficiency provisions of the IECC. So if fuel gas lighting systems are necessary to maintain the historic form, fabric, or function of a historic building, then they would already be exempt, and if they are not necessary to maintain the historic form, fabric, or function then they will not and should not be exempt.

Cost Impact: Will not increase the cost of construction.

GEW118-14: 608.7-HEINMILLER673

GEW119-14

608.7

Proponent: Neil Leslie, representing self (neil.leslie@gastechnology.org)

Delete without substitution:

~~**608.7 Fuel gas lighting systems.** Fixtures that generate illumination by combustion of fuel gas shall be included in lighting power calculations required under Sections C405.5 and C405.6 of the *International Energy Conservation Code* by converting the maximum rated Btu/h of the luminaire into watts using Equation 6-5.~~

~~Wattage Equivalent = Maximum btu/h rating of the fuel gas lighting system/3.413. **Equation 6-5**~~

~~**Exception:** Fuel gas lighting at historic buildings in accordance with Section C101.4.2 of the *International Energy Conservation Code* is not included in the calculation.~~

Reason: Gas lights are classified as decorative appliances by the manufacturers. They are installed to provide ambiance, similar to fireplaces, and are not designed or intended to provide lighting to the space. As such they are a process load and should not be included in the lighting allowance calculation.

Cost Impact: Will not increase the cost of construction.

GEW119-14: 608.7-LESLIE986

GEW120-14

608.7

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

608.7 Fuel gas and liquid fuel lighting systems. Fixtures that generate illumination by combustion of fuel gas or liquid fuel shall be included in lighting power calculations required under Sections C405.5 and C405.6 of the *International Energy Conservation Code* by converting the maximum rated Btu/h of the luminaire into watts using Equation 6-5.

Wattage Equivalent = Maximum btu/h rating of the fuel gas or liquid fuel lighting system/3.413.

Equation 6-5

Exception: Fuel gas or liquid fuel lighting at historic buildings in accordance with Section C101.4.2 of the *International Energy Conservation Code* is not included in the calculation.

Reason: The proposed changes will ensure that all of the energy used by any interior or exterior lighting fixtures, regardless of the type of energy used to create the light, will be accounted for in the lighting power calculations. This change closes a potential loophole where the energy used by any light fixture using a liquid fuel (such as kerosene) would not be accounted for.

This change will ensure that green buildings account for all of the energy being used by all lighting fixtures used in the building or on the building site.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code sections C405.5 and C405.6 referenced in the text of this proposal are numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section numbers for the 2015 Edition will be C405.4 and C405.5, respectively.

GEW120-14: 608.7-ROSENSTOCK504

GEW121-14

202, 608.8, 608.8.1, 608.8.1.1, Table 608.8.1.1(1), Table 608.8.1.1(2), Table 608.8.1.1(2), 608.8.1.2, 608.8.1.3, 608.8.2

Proponent: Jack Bailey, One Lux Studio, representing self (jbailey@oneluxstudio.com)

Delete definition without substitution:

~~**LOW VOLTAGE DRY TYPE DISTRIBUTION TRANSFORMER.** A NEMA 'Class 1' transformer that is air cooled, does not use oil as a coolant, has an input voltage \leq 600 volts, and is rated for operation at a frequency of 60 hertz.~~

Revise as follows:

608.8 Electrical system efficiency. Electrical systems shall comply with Sections 608.8.1 and 608.8.2.

~~**608.8.1 Prescriptive compliance Voltage drop in feeders.** Prescriptive compliance for electrical systems shall be in accordance with Sections 608.8.1.1 through 608.8.1.3. The voltage drop in feeder conductors shall not exceed 1.5 percent at design load.~~

~~**608.8.1.1 Transformer efficiency.** Distribution transformers installed on the load side of the service disconnecting means shall comply with the provisions of Tables 608.8.1.1(1), 608.8.1.1(2) and 608.8.1.1(3), and the Energy Policy Act of 2005 as applicable.~~

~~**Exception:** The following transformers are exempt from the efficiency standards of Section 608.8.1.1:~~

- ~~1. Transformers not covered by the Energy Policy Act of 2005.~~
- ~~2. Transformers for special purpose applications, and not used in general purpose applications.~~
- ~~3. Transformers with multiple voltage taps where the highest tap is not less than 20 percent more than the lowest tap.~~
- ~~4. Drive transformers, rectifier transformers, auto-transformers, uninterruptible power supply transformers, impedance transformers, regulating transformers, sealed and nonventilating transformers, machine tool transformers, welding transformers, grounding transformers, and testing transformers.~~

**TABLE 608.8.1.1(1)
LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS
(Maximum 600 Volt Primary)^a**

SINGLE PHASE		THREE PHASE	
kVA Rating	Minimum Efficiency (%)	kVA Rating	Minimum Efficiency (%)
15	97.7	15	97.0
25	98.0	30	97.5
37.5	98.2	45	97.7
50	98.3	75	98.0
75	98.5	112.5	98.2
100	98.6	150	98.3

SINGLE PHASE		THREE PHASE	
167	98.7	225	98.5
250	98.8	300	98.6
333	98.9	500	98.7
—	—	750	98.8
—	—	1000	98.9

a. All efficiency values for low-voltage transformers are at 35 percent of nameplate-rated load, determined in accordance with the DOE test procedure. 10 CFR Part 431, Sub-part K, Appendix A.

TABLE 608.8.1.1(2)
MEDIUM-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS
(Maximum 34,500 Volt Primary, Maximum 600 Volt Secondary)^a

SINGLE PHASE				THREE PHASE			
kVA Rating	20-45 kV BIL Minimum Efficiency (%)	46-95 kV BIL Minimum Efficiency (%)	>96 kV BIL Minimum Efficiency (%)	kVA Rating	20-45 kV BIL Minimum Efficiency (%)	46-95 kV BIL Minimum Efficiency (%)	>96 kV BIL Minimum Efficiency (%)
15	98.10	97.86	—	15	97.50	97.18	—
25	98.33	98.12	—	30	97.90	97.63	—
37.5	98.49	98.30	—	45	98.10	97.86	—
50	98.60	98.42	—	75	98.33	98.12	—
75	98.73	98.57	98.53	112.5	98.49	98.30	—
100	98.82	98.67	98.63	150	98.60	98.42	—
167	98.96	98.83	98.80	225	98.73	98.57	98.53
250	99.07	98.95	98.94	300	98.82	98.67	98.63
333	99.14	99.03	98.99	500	98.96	98.83	98.80
500	99.22	99.12	99.09	750	99.07	98.95	98.94
667	99.27	99.18	99.15	1000	99.14	99.03	98.99
833	99.31	99.23	99.20	1500	99.22	99.12	99.09
—	—	—	—	2000	99.27	99.18	99.15
—	—	—	—	2500	99.34	99.23	99.20

BIL = Basic impulse insulation level.

a. All efficiency values for medium-voltage transformers are at 50 percent of nameplate-rated load, determined in accordance with the DOE test procedure. 10 CFR Part 431, Sub-part K, Appendix A.

TABLE 608.8.1.1(3)
MEDIUM-VOLTAGE LIQUID-IMMERSED
DISTRIBUTION TRANSFORMERS
(Maximum 34,500 Volt Primary, Maximum 600 Volt Secondary)^a

SINGLE PHASE		THREE PHASE	
kVA Rating	Minimum Efficiency (%)	kVA Rating	Minimum Efficiency (%)
40	98.62	45	98.36
45	98.76	30	98.62
25	98.94	45	98.76
37.5	99.04	75	98.94
50	99.08	112.5	99.04
75	99.17	150	99.08
100	99.23	225	99.17
167	99.25	300	99.23
250	99.32	500	99.25
333	99.36	750	99.32
500	99.42	1000	99.36
667	99.46	1500	99.42
883	99.49	2000	99.46
—	—	2500	99.49

— a. All efficiency values for medium-voltage transformers are at 50 percent of nameplate rated load, determined in accordance with the DOE test procedure, 10 CFR Part 431, Sub-part K, Appendix A.

608.8.1.2 Voltage drop in feeders. The voltage drop in feeder conductors shall not exceed 1.5 percent at design load.

608.8.1.3-608.8.2 Voltage drop in branch circuits. The voltage drop in branch circuit conductors shall not exceed 1.5 percent at design load.

Reason: CE329 AS added transformer efficiency standards to the IECC. Since these are included in the IECC they are no longer needed in the IgCC. No change has been proposed for the voltage drop requirements, just a renumbering of sections.

Cost Impact: Will not increase the cost of construction.

GEW121-14: 608.8-BAILEY1133

GEW122-14
608.8.1.1, 903.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Delete without substitution:

608.8.1.1 Transformer efficiency. Distribution transformers installed on the load side of the service disconnecting means shall comply with the provisions of Tables 608.8.1.1(1), 608.8.1.1(2) and 608.8.1.1(3), and the Energy Policy Act of 2005 as applicable.

Exception: The following transformers are exempt from the efficiency standards of Section 608.8.1.1:

1. Transformers not covered by the Energy Policy Act of 2005.
2. Transformers for special purpose applications, and not used in general purpose applications.
3. Transformers with multiple voltage taps where the highest tap is not less than 20 percent more than the lowest tap.
4. Drive transformers, rectifier transformers, auto-transformers, uninterruptible power supply transformers, impedance transformers, regulating transformers, sealed and nonventilating transformers, machine tool transformers, welding transformers, grounding transformers, and testing transformers.

TABLE 608.8.1.1(1)
LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS
(Maximum 600 Volt Primary)^a

SINGLE PHASE		THREE PHASE	
kVA Rating	Minimum Efficiency (%)	kVA Rating	Minimum Efficiency (%)
15	97.7	15	97.0
25	98.0	30	97.5
37.5	98.2	45	97.7
50	98.3	75	98.0
75	98.5	112.5	98.2
100	98.6	150	98.3
167	98.7	225	98.5
250	98.8	300	98.6
333	98.9	500	98.7
—	—	750	98.8
—	—	1000	98.9

a.— All efficiency values for low-voltage transformers are at 35 percent of nameplate-rated load, determined in accordance with the DOE test procedure. 10 CFR Part 431, Sub-part K, Appendix A.

TABLE 608.8.1.1(2)
MEDIUM-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS
(Maximum 34,500 Volt Primary, Maximum 600 Volt Secondary)^a

SINGLE PHASE				THREE PHASE			
kVA Rating	20-45 kV BIL Minimum Efficiency (%)	46-95 kV BIL Minimum Efficiency (%)	>96 kV BIL Minimum Efficiency (%)	kVA Rating	20-45 kV BIL Minimum Efficiency (%)	46-95 kV BIL Minimum Efficiency (%)	>96 kV BIL Minimum Efficiency (%)
15	98.10	97.86	—	15	97.50	97.18	—
25	98.33	98.12	—	30	97.90	97.63	—
37.5	98.49	98.30	—	45	98.10	97.86	—
50	98.60	98.42	—	75	98.33	98.12	—
75	98.73	98.57	98.53	112.5	98.49	98.30	—
100	98.82	98.67	98.63	150	98.60	98.42	—
167	98.96	98.83	98.80	225	98.73	98.57	98.53
250	99.07	98.95	98.91	300	98.82	98.67	98.63
333	99.14	99.03	98.99	500	98.96	98.83	98.80
500	99.22	99.12	99.09	750	99.07	98.95	98.91
667	99.27	99.18	99.15	1000	99.14	99.03	98.99
833	99.31	99.23	99.20	1500	99.22	99.12	99.09
—	—	—	—	2000	99.27	99.18	99.15
—	—	—	—	2500	99.31	99.23	99.20

BIL = Basic impulse insulation level.

a.—All efficiency values for medium-voltage transformers are at 50 percent of nameplate-rated load, determined in accordance with the DOE test procedure. 10 CFR Part 431, Sub-part K, Appendix A.

TABLE 608.8.1.1(3)
MEDIUM-VOLTAGE LIQUID-IMMERSED DISTRIBUTION TRANSFORMERS
(Maximum 34,500 Volt Primary, Maximum 600 Volt Secondary)^a

SINGLE PHASE		THREE PHASE	
kVA Rating	Minimum Efficiency (%)	kVA Rating	Minimum Efficiency (%)
10	98.62	15	98.36
15	98.76	30	98.62
25	98.91	45	98.76
37.5	99.01	75	98.91
50	99.08	112.5	99.01
75	99.17	150	99.08
100	99.23	225	99.17

SINGLE PHASE		THREE PHASE	
167	99.25	300	99.23
250	99.32	500	99.25
333	99.36	750	99.32
500	99.42	1000	99.36
667	99.46	1500	99.42
883	99.49	2000	99.46
—	—	2500	99.49

a. —All efficiency values for medium-voltage transformers are at 50 percent of nameplate-rated load, determined in accordance with the DOE test procedure, 10 CFR Part 431, Sub-part K, Appendix A.

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4
Plug load controls	X	None	Functional testing	Final inspection	None	608.6
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10
Lighting controls						

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
a. Installation	X	None	Field inspection	Post-installation	None	608.11
b. Calibration	X	X	System installer/contractor or commissioning agent	Post-installation	18-24 months	611.3.3

For SI: 1 square foot = 0.0929 m².

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Code change CE329-13 was approved in 2013. It added electrical transformer requirements to the IECC. The resulting text of the 2015 IECC is shown below. Therefore, the provisions in the IgCC are not a significant energy improvement over the IECC. The SEHPCAC proposes to delete the provisions. If other proponents pursue proposals which will take the new IECC provisions and enhance their energy savings when applied under the IgCC, the SEHPCAC will consider withdrawal of this proposal. This proposal is to delete the transformer section of the IgCC in Chapter 6 and to remove the related provisions from Table 903 addressing commissioning requirements.

C405.7 Electrical transformers (Mandatory). Electric transformers shall meet the minimum efficiency requirements of Table C405.7 as tested and rated in accordance with the test procedure listed in DOE 10 CFR 431. The efficiency shall be verified through certification under an approved certification program or, where no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the transformer manufacturer.

Exceptions: The following transformers are exempt:

1. Transformers that meet the Energy Policy Act of 2005 exclusions based on the DOE 10 CFR 431 definition of special purpose applications.
2. Transformers that meet the Energy Policy Act of 2005 exclusions that are not to be used in general purpose applications based on information provided in DOE 10 CFR 431
3. Transformers that meet the Energy Policy Act of 2005 exclusions with multiple voltage taps where the highest tap is at least 20 percent more than the lowest tap.
4. Drive transformers
5. Rectifier transformers
6. Auto-transformers
7. Uninterruptible power system transformers
8. Impedance transformers
9. Regulating transformers
10. Sealed and nonventilating transformers
11. Machine tool transformer
12. Welding transformer
13. Grounding transformer
14. Testing transformer

TABLE C405.7
Minimum Nominal Efficiency Levels for 10 CFR 431 Low Voltage Dry-Type Distribution Transformers

Single Phase Transformers		Three Phase Transformers	
kVA ^a	Efficiency (%) ^b	kVA ^a	Efficiency (%) ^b
15	97.7	15	97.0
25	98.0	30	97.5
37.5	98.2	45	97.7
50	98.3	75	98.0
75	98.5	112.5	98.2
100	98.6	150	98.3
167	98.7	225	98.5
250	98.8	300	98.6
333	98.9	500	98.7

		750	98.8
		1000	98.9

- a. kiloVolt-Amp rating.
- b. Nominal efficiencies shall be established in accordance with the DOE 10 CFR 431 test procedure for low voltage dry-type transformers.

Cost Impact: Will not increase the cost of construction. The proposal removes potentially conflicting provisions between the IECC and IgCC.

GEW122-14: 608.8.1.1-THOMPSON577

GEW123-14

608.9

Proponent: Glenn Heinmiller, representing International Association of Lighting Designers
(glenn@lampartners.com)

Revise as follows:

608.9 Exterior lighting. Exterior lighting on building sites shall comply with the lighting power and control requirements of Sections C405.6.1 and C405.6.2 of the *International Energy Conservation Code* regardless of how the power for that lighting is supplied.

Exception: Lighting for the following purposes is exempt:

1. Where *approved* because of historical, safety, signage, or emergency lighting considerations.
2. Roadway lighting required by governmental authorities.

Reason: The proposed change is editorial in nature. The Section reference is more general, and the language indicates what type of requirements will be found in Section C405.6. This will make the code easier to use because users will not need to refer to the IECC to understand what this requirement means.

The IgCC is unique in that it includes the entirety of building sites within its' scope, whereas the IECC only includes lighting that is powered from the building's electrical service, which is why this section of the IgCC is necessary.

Cost Impact: Will not increase the cost of construction.

Analysis: The International Energy Conservation Code section C405.6 referenced in the text of this proposal are section numbers for the 2012 Edition. Due to significant changes approved for the 2015 IECC, the section number for the 2015 Editions will be C405.5.

GEW123-14: 608.9-HEINMILLER674

GEW124-14

608.10, 608.11, 903.1, Table 903.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Delete without substitution:

~~**608.10 Verification of lamps and ballasts.**— Prior to issuance of a certificate of occupancy, the field inspector shall confirm the installation of luminaires, type and quantity; lamps, type, wattage and quantity, and ballasts, type and performance for not less than one representative luminaire of each type, for consistency with the *approved* construction documents. Where a discrepancy is found, energy calculations shall be revised and resubmitted.~~

~~**608.11 Verification of lighting controls.**— Prior to issuance of a certificate of occupancy, the field inspector shall confirm the installation of lighting controls shown on the *approved* construction documents. Where a discrepancy is found, the installation shall be reviewed for conformance to the *International Energy Conservation Code* and Sections 608.2, 608.3, 608.4, 608.5, and 608.6.~~

Revise as follows:

903.1 General. Where application is made for construction as described in this section, the registered design professional in responsible charge or approved agency shall perform commissioning during construction and after occupancy as required by Table 903.1. Where Table 903.1 specifies that commissioning is to be done on a periodic basis, the registered design professional in responsible charge shall provide a schedule of periodic commissioning with the submittal documents that shall be reviewed and *approved* by the *code official*.

The approved agency shall be qualified and shall demonstrate competence, to the satisfaction of the *code official*, for the commissioning of the particular type of construction or operation. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency provided those personnel meet the qualification requirements of this section to the satisfaction of the *code official*. The approved agency shall provide written documentation to the *code official* demonstrating competence and relevant experience or training. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of commissioning activities for projects of similar complexity and material qualities.

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 6: Lighting						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4
Plug load controls	X	None	Functional testing	Final inspection	None	608.6
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1
Verification of lamp installed lighting efficiencies	X	X	Field inspection	Final inspection	18-24 months	608.10 608.1, 608.9
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10 608.1, 608.9
Lighting controls						
a. Installation	X	None	Field inspection	Post-installation	None	608.11 608.1, 608.2, 608.3, 608.4, 608.5, 608.6
b. Calibration	X	X	System installer/contractor or commissioning agent	Post-installation	18-24 months	611.3.3

(Portions of Table not shown remain unchanged)

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The provisions are unnecessary as they are simply restating the basic process of inspecting the building, building elements and installed equipment prior to issuing a certificate of occupancy. All inspections are based on the approved construction documents. Every inspector knows what to do if the installation doesn't comply with the plans. There is no reason for restatement in Section 608. Deletion of these sections requires clarification in Table 903.1 for commissioning and inspection efforts. The intent of the commissioning/inspection requirement of verification of lamps is to determine that the correct installations are made to obtain planned efficiencies. Lighting controls are specified in Sections 608.1 through 608.6. Compliance with those provisions should be specified in Table 903.1

The committee has submitted a more comprehensive change addressing commissioning, inspection and Chapter 9. This change to remove these sections needs to be addressed separately.

Cost Impact: Will not increase the cost of construction. The change is editorial in nature. It eliminates text which is procedural in nature and not needed within a typical construction code.

GEW124-14: 608.10-THOMPSON572

GEW125-14

608.13 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org); Jim Edelson, representing NBI; Ryan Meres (ryan@imt.org)

Add new text as follows:

608.13 Temporary Generator and Boiler. Buildings containing Group I, R-1, or R-2 occupancies shall be provided with a means to connect a temporary external generator that is capable of providing power for exit signs and means of egress illumination serving such occupancy, fire alarm systems serving such occupancy, not less than one elevator that serves all floors; and lighting in sleeping spaces and as required for the provision of medical services. Such connecting means shall be located at or above the design flood elevation.

Buildings containing Group I occupancies having their boiler plants located below the design flood elevation shall be provided with a means to connect a temporary external boiler that is capable of maintaining design comfort temperatures in the building. Such connecting means shall be located at or above the design flood elevation.

Exception: A connecting means for a temporary generator is not required for buildings having emergency or standby power systems, including on-site renewable energy systems, that are permanently installed above the design flood elevation and that are capable of providing power for the systems and loads listed in this section for a time period of not less than 72 hours.

Reason: Convenient hookups for generators can make power outages – such as those caused by flooding – much easier to manage because buildings can directly attach temporary equipment. If these permanent hookups are not installed, buildings often use ad hoc connections that can present a safety risk or that may cause unexpected interruption of services. To maintain heat in buildings housing sick or elderly people, health care facilities, nursing homes and other group care facilities where there is a risk of losing boiler operation due to flooding should be required to install “quick-connect” hookups for boilers as well as generators.

New York City established a similar regulation in 2013.

Bibliography:

NYC Building Resiliency Task Force, Proposal 20: Add Hookups for Temporary Generators & Boilers ([Proposal](#))

NYC Local Law 108 of 2013 ([Law](#); [Legislation at a Glance](#))

NYC Administrative Code Section 28-315.8.2 and 28-315.8.3 ([Code Reference](#)) NYC Building Code Appendix G, Section 311.2 and 311.3 ([Code Reference](#))

Cost Impact: Will not increase the cost of construction.

GEW125-14:608.13 (NEW)-SCHEIB988

GEW 126-14 609

Proponent: Craig Conner, Building Quality (craig.conner@mac.com), representing self

Delete without substitution:

~~**SECTION 609
SPECIFIC APPLIANCES AND EQUIPMENT**~~

Reason: Some of the section is out of scope. Some is in the IECC. Elevators and Escalators are not normally handled by the same code staff.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GEW 126-14: 609-KLEIN1214

GEW127-14

609.1, Table 609.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

609.1 General. This section provides requirements for appliances and equipment installed in the building or on the building site. Permanent appliances and equipment shall comply with the provisions of Section 609.2, and portable appliances and equipment shall comply with the provisions of Section 609.3.

Exception: Section 609 does not apply to appliances and equipment in compliance with Sections 605 through 608 and those specified in Table 609.1.

**TABLE 609.1
APPLIANCES AND EQUIPMENT COVERED BY FEDERAL EFFICIENCY STANDARDS**

RESIDENTIAL PRODUCTS	COMMERCIAL PRODUCTS
Battery chargers^a	Automatic ice makers
Ceiling fans and ceiling fanlight kits	Commercial clothes washers
Clothes dryers	Distribution transformers
Clothes washers	Electric motors^a
Dehumidifiers	HD lamps^a
Dishwashers	Metal halide lamp fixtures
Fluorescent and incandescent lamps	Refrigerated beverage vending machines^a
Fluorescent lamp ballasts^a	Walk-in coolers and walk-in freezers
Microwave ovens^a	
Ranges and ovens	
Refrigerators, refrigerator-freezers, and freezers	
Room air conditioners	
Torchieres	

a. These products currently have no federal standards. NOTE: U.S. Department of Energy rulemakings are underway or scheduled.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

The title of the table is that these appliances are covered by Federal efficiency standards and therefore exempt from Section 609. The footnote indicates that where shown in that table, the specific equipment doesn't have a federal standard. Since these 6 types of equipment are without federal standards, they shouldn't be included in a table listing those that have such standards. If the Department of Energy has since issued minimum efficiency standards for the 6 listed pieces of equipment, then DOE should submit the appropriate change. The code shouldn't list in a table of equipment with efficiency standards, those which don't have any such standard.

Cost Impact: Will not increase the cost of construction. Editorial revision.

GEW127-14: TABLE 609.1-THOMPSON573

GEW128-14
609.1, Table 609.1

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

609.1 General. This section provides requirements for appliances and equipment installed in the building or on the building site. Permanent appliances and equipment shall comply with the provisions of Section 609.2, and portable appliances and equipment shall comply with the provisions of Section 609.3.

Exception: Section 609 does not apply to appliances and equipment in compliance with Sections 605 through 608 and those specified in Table 609.1.

TABLE 609.1
APPLIANCES AND EQUIPMENT COVERED BY FEDERAL EFFICIENCY STANDARDS

RESIDENTIAL PRODUCTS	COMMERCIAL PRODUCTS
Battery chargers ^a	Automatic ice makers
	<u>Commercial air conditioners and heat pumps</u>
<u>Boilers</u>	Commercial clothes washers
Ceiling fans and ceiling fanlight kits	<u>Commercial packaged boilers</u>
	<u>Commercial unit heaters</u>
	<u>Commercial refrigerators, refrigerators-freezers, and freezers</u>
	<u>Commercial warm air furnaces</u>
	<u>Commercial water heaters</u>
	<u>Commercial room air conditions</u>
	Distribution transformers
<u>Central air conditioners and heat pumps</u>	Electric motors ^a
Clothes dryers	HD lamps ^a
Clothes washers	<u>Illuminated exit signs</u>
<u>Compact fluorescent lamps</u>	Metal halide <u>ballasts</u> and lamp fixtures
Dehumidifiers	
<u>Direct heating equipment</u>	
Dishwashers	Refrigerated beverage vending machines ^a
<u>External power supplies</u>	
<u>General service</u> fluorescent and incandescent lamps	<u>Small electric motors</u>
	<u>Traffic signal and pedestrian modules</u>

RESIDENTIAL PRODUCTS	COMMERCIAL PRODUCTS
<p>Fluorescent lamp ballasts^a</p> <p><u>Furnaces</u></p> <p>Furnace fans</p> <p>Microwave ovens^a</p> <p><u>Pool heaters</u></p> <p>Ranges and ovens</p> <p>Refrigerators, refrigerator-freezers, and freezers</p> <p>Room air conditioners</p> <p>Torchieres</p>	<p>Walk-in coolers and walk-in freezers</p>

a. These products currently have no federal standards. NOTE: U.S. Department of Energy rulemakings are underway or scheduled.

Reason: This will update and revise the information in Table 609.1. The information in the table is not complete or up to date, and this revision will make sure that the table information is accurate.

Cost Impact: Will not increase the cost of construction. There are no costs associated with updating this table.

GEW128-14: TABLE609.1-ROSENSTOCK453

GEW129-14

609.2.1.2.1

Proponent: Marilyn Williams, National Electrical Manufacturers Association, representing NEMA
(mar_williams@nema.org)

Revise as follows:

609.2.1.2.1 Motor. Induction motors with a Class IE2 efficiency rating, as defined by IEC EN 60034-30, or alternative technologies, such as permanent magnet synchronous motors that have equal or better efficiency, shall be used. Induction electric motors that are covered by U.S. statutory efficiency standards shall meet not less than IEC IE2 or IE3 levels of efficiency, depending on the type of induction electric motor.

Reason: What we proposed being added merely advises the user that there are certain other efficiency requirements that need to be considered for use in the US (namely DOE requirements) that include certain levels of efficiency that may be in addition to those cited in the IEC 60034-30 Standard.

Cost Impact: Will not increase the cost of construction.

GEW129-14: 609.2.1.2.1-WILLIAMS991

GEW130-14

609.2.2.3

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

Delete without substitution:

~~**609.2.2.3 Energy recovery.** Down-running escalators equipped with direct variable frequency drives shall use regenerative drives and return recovered energy to the building electrical power system.~~

Reason: A provision requiring regenerative drive was added to the 2015 IECC by CE332-13. Section 405.8 of the 2015 IECC will be as follows:

"C405.8 Regenerative drive. An escalator designed either for one-way down operation only or for reversible operation shall have a variable frequency regenerative drive that supplies electrical energy to the building electrical system when the escalator is loaded with passengers whose combined weight exceeds 750 pounds."

Cost Impact: Will not increase the cost of construction.

GEW130-14: 609.2.2.3-TRAXLER663

GEW131-14

609.2.2.5

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

Revise as follows:

609.2.2.5 Standby mode. ~~During standby mode, escalators and moving walkways shall be capable of being automatically slowed to not greater than 50 percent of nominal speed.~~ Escalators and moving walkways shall be capable of being automatically turned off when the building is unoccupied or outside of facility operations. In locations where multiple escalators serve the same passenger load, not less than 50 percent of the escalators shall have the capability of being turned off in response to reduced occupant traffic.

Reason: This subject will be covered in the 2015 IECC. CE333-13, which was approved as submitted, added the following language:

"C405.2 Escalators and moving walks. Escalators and moving walks shall comply with ASME A17.1/CSA B44 and shall have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers."

Cost Impact: Will not increase the cost of construction.

GEW131-14: 609.2.2.5-TRAXLER475

GEW 132-14

202, 610, 610.1, 610.1.1, 610.1.2, 610.2, 610.2.1, 610.2.2, 610.2.2.1, 610.3, 610.3.1, 610.4, 610.5, 610.5.1, 610.5.2, 610.6 (New), A106, A106.6,

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner (craig.conner@mac.com)

Revise definition as follows:

ONSITE RENEWABLE ENERGY SYSTEM. An energy generation system located on the building or building site that derives its energy from a renewable energy source.

RENEWABLE ENERGY CREDIT (REC). An REC represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. An REC, and its associated attributes and benefits, is sold separately from the underlying physical electricity associated with an onsite a renewable energy source. REC's allow organizations to support renewable energy development and protect the environment where renewable power products are not locally available. There are two approaches to verifying REC ownership and the right to make environmental claims: (1) REC contracts from a list of approved providers, including an audit of the chain of custody; and (2) REC tracking systems.

RENEWABLE ENERGY SOURCE, ~~ONSITE.~~ Energy derived from solar radiation, wind, waves, tides, biogas, biomass, or geothermal energy. The energy system providing onsite renewable energy is located on or adjacent to the building site, and generate energy for use on the building site or to send back to the energy supply system.

Revise as follows:

610 BUILDING-RENEWABLE ENERGY SYSTEMS

610.1 Renewable energy systems requirements. Buildings that consume energy shall comply with this section. Each building or surrounding lot or building site where there are multiple buildings on the building site shall be equipped with one or more renewable energy systems in accordance with this section.

Renewable energy systems shall comply with the requirements of Section 610.2 for solar photovoltaic systems, Section 610.3 for wind systems, or Section 610.4 for solar water heating systems, and Section 610.5 for performance monitoring and metering of these systems as approved by the code official. These systems shall be commissioned in accordance with the requirements of Section 611.

Exception: Renewable energy systems are not required for the following:

1. Buildings or building sites where there are multiple buildings on the building site providing not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the site, with onsite renewable energy using a combination of renewable energy generation systems complying with the requirements of Section 610.2, 610.3, or 610.4.
2. Where not less than 4 percent of the total annual building energy consumption from renewable generation takes the form of a 10-year commitment to renewable energy credit ownership, confirmed by the code official.
3. Where the combined application of onsite generated renewable energy and a commitment to renewable energy credit ownership as confirmed by the code official, totals not less than 4 percent of the total annual building energy consumption from renewable generation.

Buildings shall include onsite renewable energy systems that provide not less than 2 percent of the estimated annual electrical energy used for heating, cooling, ventilation, lighting, and service water heating.

610.1.1 Building performance-based compliance. Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.1, performance-based compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total calculated annual energy use

of the building, or collective buildings on the site.

610.1.2 Building prescriptive compliance. Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.2, prescriptive compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the building site, with onsite renewable energy by calculation demonstrating that onsite renewable energy production has a rating of not less than 1.75 Btu/h (0.5 W) or not less than 0.50 watts per square foot of conditioned floor area, and using any single or combination of renewable energy generation systems meeting the requirements of Sections 610.2, 610.3, or 610.4.

610.2 Solar photovoltaic systems. Building averaging. Solar photovoltaic systems shall be sized to provide not less than 2 percent of the total estimated annual electric energy consumption of the building, or collective buildings on the building site in accordance with Section 610.1.1 or 610.1.2.

The required renewable energy shall be computed for each building or for a group of buildings.

610.2.1 Limitation. Solar photovoltaic systems shall not be used to comply with Section 610.1 where building sites have total global insolation levels lower than 2.00 kWh/m²/day as determined in accordance with NREL SERI TR 642-761.

610.2.2 Requirements. The installation, inspection, maintenance, repair and replacement of solar photovoltaic systems and system components shall comply with the manufacturer's instructions, Section 610.2.2.1, the *International Fire Code*, the *International Building Code* and NFPA 70.

610.2.2.1 Performance verification. Solar photovoltaic systems shall be tested on installation to verify that the installed performance meets the design specifications. A report of the tested performance shall be provided to the building owner.

610.3 Wind energy systems. Alternative sources. Wind energy systems shall be designed, constructed and sized to provide not less than 2 percent of the total estimated annual electric energy consumption of the building, or collective buildings on the building site in accordance with NFPA 70 and Section 610.1.1 or 610.1.2.

The following shall be considered as substitutes for any portion of the renewable energy requirement of Section 610.1:

1. Conserving additional non-renewable energy, where the conserved non-renewable energy equals twice the renewable energy credited.
2. Renewable energy credits (RECs) or local utility green power is purchased, where the purchased amount equals ten times the renewable energy credited. Documentation of the purchase shall be provided.

610.3.1 Installation, location and structural requirements. Wind energy systems shall be located on the building, adjacent to the building, or on the building site.

610.4 Solar water heating equipment. Prescriptive compliance. Not less than 10 percent of the building's annual estimated hot water energy usage shall be supplied by onsite solar water heating equipment.

Buildings or their building sites that are designed and constructed with one or more onsite renewable energy systems that have the capacity to provide not less than 0.50 watt per square foot of conditioned floor area shall be considered to be in compliance with Section 610.

610.5 Renewable energy system performance monitoring and metering. System requirements. Renewable energy systems shall be metered and monitored in accordance with Sections 610.5.1 and 610.5.2.

The installation, inspection, repair and replacement of onsite renewable energy systems shall comply with

manufacturer's instructions, the *International Fire Code*, the *International Building Code* and NFPA 70.

610.5.1 Metering. Renewable energy systems shall be metered separately from the building's electrical and fossil fuel meters. Renewable energy systems shall be metered to measure the amount of renewable electric or thermal energy generated on the building site in accordance with Section 603.

610.5.2 Monitoring. Renewable energy systems shall be monitored to measure the peak electric or thermal energy generated by the renewable energy systems during the building's anticipated peak electric or fossil fuel consumption period in accordance with Section 603.

610.6 Performance verification. *Onsite renewable energy systems shall be tested upon installation to verify that the installed performance meets the design specifications. Such testing shall be documented.*

Revise as follows:

A106.6 Renewable energy system project electives. Buildings seeking a renewable energy system project elective or electives shall be equipped with one or more renewable energy systems in accordance with Section 610.1 that have the capacity to provide the percent of annual energy used within the building as selected in Table A106. Capacity shall be demonstrated in accordance with Sections 610.1.1 and 610.1.2.

**TABLE A106
ENERGY CONSERVATION AND EFFICIENCY**

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A102.2	The jurisdiction shall indicate a number between and including 0 and up to and including 10 to establish the minimum total number of project electives that must be satisfied.	—
A106.1	zEPI reduction project electives	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	Project zEPI is at least 5 points lower than required by Table 302.1	<input type="checkbox"/> 1 elective
A106.1	Project zEPI is at least 10 points lower than required by Table 302.1	<input type="checkbox"/> 2 electives
A106.1	Project zEPI is at least 15 points lower than required by Table 302.1	<input type="checkbox"/> 3 electives
A106.1	Project zEPI is at least 20 points lower than required by Table 302.1	<input type="checkbox"/> 4 electives
A106.1	Project zEPI is at least 25 points lower than required by Table 302.1	<input type="checkbox"/> 5 electives
A106.1	Project zEPI is at least 30 points lower than required by Table 302.1	<input type="checkbox"/> 6 electives
A106.1	Project zEPI is at least 35 points lower than required by Table 302.1	<input type="checkbox"/> 7 electives
A106.1	Project zEPI is at least 40 points lower than required by Table 302.1	<input type="checkbox"/> 8 electives
A106.1	Project zEPI is at least 45 points lower than required by Table 302.1	<input type="checkbox"/> 9 electives
A106.1	Project zEPI is at least 51 points lower than required by Table 302.1	<input type="checkbox"/> 10 electives
A106.2	Mechanical systems project elective	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.3	Service water heating	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.4	Lighting systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.5	Passive design	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems — 5 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems — 10 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.6	Renewable energy systems — 20 percent	<input type="checkbox"/> Yes <input type="checkbox"/> No

Reason: Electricity from renewable sources is usually environmentally preferable to electricity generated from conventional sources. This proposal simplifies the existing renewables section, which is overly complex and difficult to enforce. This also adds new options, as renewable systems are impractical for some buildings.

- --New 610.1 gives the basic requirement, 2% of the electricity is renewables, in a simple and clear manner.

- --New 610.2 makes it clear the requirement can be computed for either individual buildings or a group of buildings.
- --New 610.3 offers important alternatives. An onsite renewables requirement is not viable unless practical alternatives are included. For example many downtown buildings are nested between, and shaded by larger buildings. This proposal allows three options.

Item #1 allows twice as much non-renewable energy savings as an alternative to renewables.

Item #2 allows purchased Renewable Energy Credits (RECs) or electricity from a local green power program. Both the RECs and the green power options require the up front purchase of 10 years worth of the renewable electricity requirement for the building.

Utility green power programs are available many places and local utility programs will often be the simplest. For example, over 150 utility green energy programs are listed in the US Department of Energy's web site at: <http://apps3.eere.energy.gov/greenpower/markets/pricing.shtml?page=2>

Consumers can also buy green power in the form of renewable energy certificates (RECs), which are usually available regardless of whether the local utility offers a green power product.

- --New 610.4 is a prescriptive alternative of 0.5 w/ft2 (existing Section 610.1.2) doesn't require estimating overall energy use and is useful for buildings that want PV.
- --New 610.5 references other standards already in the IGCC, with all references moved to this one section.
- --New 610.6 requires the renewable system to be tested.
- --Revised definitions for RECs, renewable energy systems, and onsite renewables energy systems are more concise. Commentary material is removed. The existing IGCC leaves out some types of renewables, but the use of these definitions includes them.
- --References to the old text are removed from the existing Appendix A.

Overall this revised renewable section is much more usable than the existing renewables section. The addition of multiple alternative is particularly important.

Cost Impact: Will not increase the cost of construction.

GEW 132-14: 610-KLEIN1216

GEW133-14

202, 610, 610.1, 610.1.1, 610.1.2, 610.2, 610.2.1, 610.2.2, 610.2.2.1, 610.3, 610.3.1, 610.4, 610.5, 610.5.1, 610.5.2

Proponent: Lorraine Ross, Intech Consulting, Inc, representing The Dow Chemical Company (Intech@tampabay.rr.com)

Revise definitions as follows:

ONSITE RENEWABLE ENERGY SYSTEM. An energy generation system located on the building or building site that derives its energy from a renewable energy source.

RENEWABLE ENERGY CREDIT (REC). An REC represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. An REC, and its associated attributes and benefits, is sold separately from the underlying physical electricity associated with an onsite renewable energy source. ~~REC's allow organizations to support renewable energy development and protect the environment where renewable power products are not locally available. There are two approaches to verifying REC ownership and the right to make environmental claims: (1) REC contracts from a list of approved providers, including an audit of the chain of custody; and (2) REC tracking systems.~~

RENEWABLE ENERGY SOURCE, ~~ONSITE.~~ Energy derived from solar radiation, wind, waves, tides, biogas, biomass, or geothermal energy. ~~The energy system providing onsite renewable energy is located on or adjacent to the building site, and generate energy for use on the building site or to send back to the energy supply system.~~

Revise as follows:

610-BUILDING ONSITE RENEWABLE ENERGY SYSTEMS

610.1 Renewable energy systems requirements. ~~Buildings that consume energy shall comply with this section. Each building or surrounding lot or building site where there are multiple buildings on the building site shall be equipped with one or more renewable energy systems in accordance with this section.~~

~~Renewable energy systems shall comply with the requirements of Section 610.2 for solar photovoltaic systems, Section 610.3 for wind systems, or Section 610.4 for solar water heating systems, and Section 610.5 for performance monitoring and metering of these systems as approved by the code official. These systems shall be commissioned in accordance with the requirements of Section 611.~~

Exception: ~~Renewable energy systems are not required for the following:~~

- ~~1. Buildings or building sites where there are multiple buildings on the building site providing not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the site, with onsite renewable energy using a combination of renewable energy generation systems complying with the requirements of Section 610.2, 610.3, or 610.4.~~
- ~~2. Where not less than 4 percent of the total annual building energy consumption from renewable generation takes the form of a 10-year commitment to renewable energy credit ownership, confirmed by the code official.~~
- ~~3. Where the combined application of onsite generated renewable energy and a commitment to renewable energy credit ownership as confirmed by the code official, totals not less than 4 percent of the total annual building energy consumption from renewable generation.~~

Any combination of onsite renewable energy systems shall be provided for buildings or building sites in accordance with Section 610.2. Compliance shall be demonstrated in accordance with Section 610.1.1 or 610.1.2.

Exceptions:

1. Onsite renewable energy systems are not required where it is confirmed by the building official that compliance with Sections 610.1.1 or 610.1.2 cannot be provided by onsite renewable energy systems alone, and renewable energy credits are purchased to provide not less than 0.5 watt per square foot of conditioned floor area. Renewable energy credits shall be for a period of 10 years, shall be paid in full and non-refundable, and documentation of full payment shall be submitted to the building official prior to issuance of the building certificate of occupancy.
2. Onsite renewable energy systems are not required where it is confirmed by the building official that compliance with Sections 610.1.1 or 610.1.2 cannot be provided by onsite renewable energy systems alone, and any combination of onsite renewable energy systems and renewable energy credits provide a rating of not less than 0.5 watt per square foot of conditioned floor area. Renewable energy credits shall be for a period of 10 years, paid in full and non-refundable, and documentation of full payment shall be submitted to the building official prior to issuance of the building certificate of occupancy.
3. Onsite renewable energy systems are not required for the following building occupancies, where not less than 10 percent of the building's total annual estimated hot water demand is met onsite with geothermal or solar thermal systems designed, constructed and installed in accordance with manufacturer's instructions.
 - 3.1. Group A-2, restaurants and banquet halls
 - 3.2. Group F, laundries
 - 3.3. Group R-1, boarding houses (transient), hotels (transient), motels (transient)
 - 3.4. Group R-2 occupancies
 - 3.5. Group A-3, health clubs and spas
 - 3.6 Group I-2, hospitals, mental hospitals and nursing homes
4. Onsite renewable energy systems are not required for buildings where not less than 10 percent of the building's total annual estimated space heating or space cooling demand is met by onsite geothermal or solar thermal systems designed, constructed and installed in accordance with manufacturer's instructions.

610.1.1 Building performance-based compliance. ~~Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.1, performance-based compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total calculated annual energy use of the building, or collective buildings on the site.~~

Buildings or their building sites shall be equipped with one or more onsite renewable energy systems that have the capacity to provide not less than 2 percent of the total calculated annual electrical energy demand of the building, or collective buildings on the site.

610.1.2 Building prescriptive compliance. ~~Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.2, prescriptive compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the building site, with onsite renewable energy by calculation demonstrating that onsite renewable energy production has a rating of not less than 1.75 Btu/h (0.5 W) or not less than 0.50 watts per square foot of conditioned floor area, and using any single or combination of renewable energy generation systems meeting the requirements of Sections 610.2, 610.3, or 610.4.~~

Buildings or their building sites shall be equipped with one or more onsite renewable energy systems that have the capacity to provide not less than 0.50 watt per square foot of conditioned floor area of the building or collective buildings on the site.

~~610.2 Solar photovoltaic systems~~ On-site renewable energy system requirements. ~~Solar photovoltaic systems shall be sized to provide not less than 2 percent of the total estimated annual electric energy consumption of the building, or collective buildings on the building site in accordance with Section 610.1.1 or 610.1.2.~~

Installation, inspection, maintenance, repair and replacement of onsite renewable energy systems shall comply with manufacturer's instructions, the International Fire Code, the International Building Code and NFPA 70.

~~610.2.1 Limitation.~~ Onsite renewable energy system performance verification. ~~Solar photovoltaic systems shall not be used to comply with Section 610.1 where building sites have total global insolation levels lower than 2.00 kWh/m²/day as determined in accordance with NREL SERI TR-642-761.~~

Onsite renewable energy systems shall be tested upon installation to verify that the installed performance meets the design specifications. A report of the tested performance shall be provided to the building owner and the building official.

~~610.2.2 Requirements~~ Onsite renewable energy system metering. ~~The installation, inspection, maintenance, repair and replacement of solar photovoltaic systems and system components shall comply with the manufacturer's instructions, Section 610.2.2.1, the International Fire Code, the International Building Code and NFPA 70.~~

Onsite renewable energy systems shall be individually metered in accordance with Section 603.3.7.

~~610.2.2.1 Performance verification.~~ ~~Solar photovoltaic systems shall be tested on installation to verify that the installed performance meets the design specifications. A report of the tested performance shall be provided to the building owner.~~

~~610.3 Wind energy systems.~~ ~~Wind energy systems shall be designed, constructed and sized to provide not less than 2 percent of the total estimated annual electric energy consumption of the building, or collective buildings on the building site in accordance with NFPA 70 and Section 610.1.1 or 610.1.2.~~

~~610.3.1 Installation, location and structural requirements.~~ ~~Wind energy systems shall be located on the building, adjacent to the building, or on the building site.~~

~~610.4 Solar water heating equipment.~~ ~~Not less than 10 percent of the building's annual estimated hot water energy usage shall be supplied by onsite solar water heating equipment.~~

~~610.5 Renewable energy system performance monitoring and metering.~~ ~~Renewable energy systems shall be metered and monitored in accordance with Sections 610.5.1 and 610.5.2.~~

~~610.5.1 Metering.~~ ~~Renewable energy systems shall be metered separately from the building's electrical and fossil fuel meters. Renewable energy systems shall be metered to measure the amount of renewable electric or thermal energy generated on the building site in accordance with Section 603.~~

~~610.5.2 Monitoring.~~ ~~Renewable energy systems shall be monitored to measure the peak electric or thermal energy generated by the renewable energy systems during the building's anticipated peak electric or fossil fuel consumption period in accordance with Section 603.~~

Reason: Renewable Energy Systems are crucial to goals for net zero energy buildings. This proposal reorganizes this section, and recognizes approved 2015 code change proposals for fire, building and electrical code compliance for a variety of renewable energy systems. Companion changes to this Section 610 rewrite are required for Chapter 2 Definitions. Most importantly, the

credible use of Renewable Energy Credits is provided as an alternate method to meet the onsite renewable energy system requirement under certain conditions.

The following is a breakdown of the reasons for the reorganization of Section 610.

Section 610.1. The charging paragraph states that onsite renewable energy systems are required and identifies installation as well as compliance mechanisms. It is important to note that the renewable energy systems can be located on the buildings or on the building site. Existing language was removed that detailed requirements for various types of renewable energy systems. The detailed installation, fire, structural, electrical, and other requirements for these systems are now very clearly defined in the IBC, IFC, and NFPA and referenced in section 610.2.

Exceptions:

The existing exceptions were rewritten for clarity and to add new exceptions for systems that cannot be complied with in the same way as those that produce electricity.

Exception 1 recognizes that there are circumstances where the onsite renewable energy system alone cannot provide the minimum of 2% of the building's electrical energy use. When this condition is confirmed by the building official, the purchase of Renewable Energy Credits that provide 0.5 watts per square foot of conditioned floor area is permitted. Therefore, under this exception, the entire requirement may be met by RECs alone. Purchase of the required RECS must be for a ten year period, shall be paid in full and non-refundable, and documentation of full payment shall be submitted to the building official prior to issuance of the building certificate of occupancy.

Exception 2 recognizes that there are circumstances where the onsite renewable energy may provide a portion of the minimum of 2% of the building's electrical energy use. When this condition is confirmed by the building official, a combination of the onsite renewable energy system and the purchase of Renewable Energy Credits that provide a combined 0.5 watts per square foot of conditioned floor area is permitted. Purchase of the required RECS must be for a ten year period, shall be paid in full and non--and documentation of full payment shall be submitted to the building official prior to issuance of the building certificate of occupancy.

Exception 3 granted to certain occupancies where there is a high volume of hot water consumption. In these cases, if 10% of the hot water needs in these buildings is met by geothermal or solar thermal systems, then the 2% minimum for renewable energy is not required. For other occupancies where the hot water consumption is relatively low, it is more beneficial to provide 2% of their annual energy usage with other renewable energy systems or RECS.

Exception 4 granted to buildings where geothermal or solar thermal systems provide at least 10% of the buildings space heating or space cooling, then the 2% minimum for renewable energy is not required.

Section 610.1.1 and Section 610.1.2. These sections identify a performance based or prescriptive compliance path for the onsite renewable energy system requirement.

Section 610.2. This section refers the user to the appropriate codes and manufacturer's instructions for requirements related to installation, inspection, etc. of onsite renewable energy systems.

Existing sections 610.2, 610.3, 610.4 attempted to put system specific requirements in this code. In the 2015 IBC the system specific requirements were adequately added/addressed. There is no longer a need for this type of information in the IgCC so it is deleted.

Section 610.2.1. This existing section related to performance verification has been adapted to apply to all renewable energy systems.

Section 610.2.2. This existing section has been changed to reflect the fact that monitoring requirements did not make the cut and are not found in section 603. The appropriate reference is made to the metering section.

Chapter 2:

Definitions for Renewable Energy Credit (REC) and Renewable Energy Source, Onsite have been modified. A new definition for Onsite Renewable Energy System has been added.

Renewable Energy Credit (REC), was modified to remove unnecessary language from the definition. The deleted language is more appropriate for a user guide.

Renewable Energy Source, Onsite was modified to Renewable Energy Source and to remove language that is related to systems. Onsite Renewable Energy System is a new added definition that defines systems using renewable energy sources as a means of generating energy for the building or building site. This term is widely used throughout section 610.

Cost Impact: Will not increase the cost of construction. This proposal simplifies this requirement and will ease compliance and enforcement of onsite renewable energy systems.

GEW133-14: 610-ROSS1103

GEW134-14

610.1, 610.1.1, 610.1.2, 610.4

Proponent: Charles Foster, Steffes Corporation, representing self (cfoster20187@yahoo.com)

Revise as follows:

610.1 Renewable energy systems requirements. Buildings that consume energy shall comply with this section. Each building or surrounding lot or building site where there are multiple buildings on the building site shall be equipped with one or more renewable energy systems in accordance with this section.

Renewable energy systems shall comply with the requirements of Section 610.2 for solar photovoltaic systems, Section 610.3 for wind systems, or Section 610.4 for solar water heating systems, and Section 610.5 for performance monitoring and metering of these systems as approved by the code official. These systems shall be commissioned in accordance with the requirements of Section 611.

Exception: Renewable energy systems are not required for the following:

1. Buildings or building sites where there are multiple buildings on the building site providing not less than ~~2~~ 3 percent of the total estimated annual energy use of the building, or collective buildings on the site, with onsite renewable energy using a combination of renewable energy generation systems complying with the requirements of Section 610.2, 610.3, or 610.4.
2. Where not less than ~~4~~ 5 percent of the total annual building energy consumption from renewable generation takes the form of a 10-year commitment to renewable energy credit ownership, confirmed by the code official.
3. Where the combined application of onsite generated renewable energy and a commitment to renewable energy credit ownership as confirmed by the code official, totals not less than ~~4~~ 5 percent of the total annual building energy consumption from renewable generation.

610.1.1 Building performance-based compliance. Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.1, performance-based compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than ~~23~~ percent of the total ~~estimated calculated~~ annual energy use of the building, or collective buildings on the site.

610.1.2 Building prescriptive compliance. Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.2, prescriptive compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than ~~2~~ 3 percent of the total estimated annual energy use of the building, or collective buildings on the building site, ~~with onsite renewable energy by calculation demonstrating that onsite renewable energy production has a rating of not less than 1.75 Btu/h (0.5 W) or not less than 0.50 watts per square foot of conditioned floor area, and using any single or combination of renewable energy generation systems meeting the requirements of Sections 610.2, 610.3, or 610.4.~~

610.4 Solar water heating equipment. Not less than ~~40~~ 20 percent of the building's annual estimated hot water energy usage shall be supplied by onsite solar water heating equipment.

Reason: This proposal does five primary things:

1. increases the onsite renewable requirement from 2% to 3%,
2. increases the REC purchase requirement from 4% to 5%,

3. reduces the RC commitment time from 10 to 5 years,
4. cleans up unintelligible language in Section 610.1.2., and
5. increases the solar water heating requirement from 10% to 20%.

The price of onsite solar is decreasing as the cost to produce solar photovoltaic panels falls. Moreover, the IgCC should aggressively promote renewable energy. Moving from a 2% to 3% requirement is not unreasonable given the market and the goals of the IgCC.

The same argument holds for increasing REC purchase requirements from 4% to 5%. The 10 year REC purchase requirement that currently exists in the IgCC is too long as serves as a barrier to the efficient development of grid-scale renewable energy projects. This proposal suggests 5 years as an alternative.

Next, some of the existing language in Section 610.1.2 is, at best, confusing. This proposal removes the confusing language.

Finally, the solar water heating requirement in Section 610.4 is very low. Solar thermal is a proven technology that can easily economically provide virtually all the domestic hot water for most commercial office buildings, much less a green building. The IgCC should increase the percentage from 10% to 20%.

Cost Impact: Will not increase the cost of construction.

GEW134-14: 610.1.1-FOSTER525

GEW135-14

610.2, 610.3, 610.5.1, 610.5.2

Proponent: Charles Foster, Steffes Corp., representing self (cfoster20187@yahoo.com)

Revise as follows:

610.2 Solar photovoltaic systems. Solar photovoltaic systems shall be sized to provide not less than 2 percent of the total estimated annual ~~electric~~ energy consumption of the building, or collective buildings on the building site in accordance with Section 610.1.1 or 610.1.2.

610.3 Wind energy systems. Wind energy systems shall be designed, constructed and sized to provide not less than 2 percent of the total estimated annual ~~electric~~ energy consumption of the building, or collective buildings on the building site in accordance with NFPA 70 and Section 610.1.1 or 610.1.2.

610.5.1 Metering. Renewable energy systems shall be metered separately from the building's electrical and fossil fuel meters and shall. ~~Renewable energy systems shall be metered to measure the amount of renewable electric or thermal energy generated on the building site in accordance with Section 603. Such metering shall include the renewable energy system output and time of production to facilitate the monitoring required by Section 610.5.2.~~

610.5.2 Monitoring. Renewable energy systems shall be monitored at least monthly to determine the coincidence between ~~measure~~ the peak electric or thermal energy generated by the renewable energy systems ~~during~~ and the building's ~~anticipated~~ peak electric or fossil fuel consumption period in accordance with Section 603.

Reason: This proposal addresses two issues:

1. a mismatch in scope between various sections on the amount of renewable energy required, and
2. cleans up awkward language on metering and monitoring.

1. Sections 610.1.1 and 610.1.2 establish minimum size requirements for on-site renewable energy facilities. Both of these sections require "2 percent of the total calculated annual energy use of the building" to be provided by on-site renewable energy systems. This would include the use of all energy sources including electricity, gas, propane, oil and any other fuel source. Sections 610.2 and 610.3, however, change the language to speak only to "2 percent of the total estimated **electric** energy consumption," not the broader scope of "total calculated annual energy consumption" as required in Sections 610.1 and 610.2. (emphasis added)

Even if a reading of these various sections could be tortured into making some sense, the incentive would be in direct conflict with green building goals as it would tend to encourage the use of on site fossil fuels in lieu of investing in on-site renewables.

Making these changes would also reconcile Sections 610.2 and 3 with Section 610.4 that requires 10 percent of the "building's annual estimated hot water energy usage," thus broadly addressing all fuels and not just electricity.

2. Sections 610.5.1 and 610.5.2 address metering and monitoring of renewable energy systems. The proposed change to Section 610.5.1 attempts to streamline the section and to add some specificity as to the metering output requirements. Currently, Section 610.5.2 requires "monitoring" but it does not provide any guidance; continuous monitoring? quarterly? The proposal simply attempts to require periodic and systematic monitoring.

Cost Impact: Will not increase the cost of construction.

GEW135-14: 610.2-FOSTER507

GEW136-14

610.1, 610.1.2, 610.5 (New), 610.5.1 (New), 610.5.2 (New), 610.5.3 (New), 610.6 (New), 610.6.1 (New), 610.6.2 (New), 610.6.3 (New)

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

610.1 Renewable energy systems requirements. Buildings that consume energy shall comply with this section. Each building or surrounding lot or building site where there are multiple buildings on the building site shall be equipped with one or more renewable energy systems in accordance with this section.

Renewable energy systems shall comply with the requirements of Section 610.2 for solar photovoltaic systems, Section 610.3 for wind systems, ~~or~~ Section 610.4 for solar water heating systems, Section 610.5 for biogas systems, or Section 610.6 for biomass systems, and shall comply with Section ~~610.5~~ 610.7 for performance monitoring and metering of these systems as *approved* by the *code official*. These systems shall be commissioned in accordance with the requirements of Section 611.

Exception: Renewable energy systems are not required for the following:

1. Buildings or building sites where there are multiple buildings on the building site providing not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the site, with onsite renewable energy using a combination of renewable energy generation systems complying with the requirements of Section 610.2, 610.3, ~~or~~ 610.4, 610.5, or 610.6.
2. Where not less than 4 percent of the total annual building energy consumption from renewable generation takes the form of a 10-year commitment to *renewable energy credit* ownership, confirmed by the *code official*.
3. Where the combined application of onsite generated renewable energy and a commitment to *renewable energy credit* ownership as confirmed by the *code official*, totals not less than 4 percent of the total annual building energy consumption from renewable generation.

610.1.2 Building prescriptive compliance. Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.2, prescriptive compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total estimated annual energy use of the building, or collective buildings on the building site, with onsite renewable energy by calculation demonstrating that onsite renewable energy production has a rating of not less than 1.75 Btu/h (0.5 W) or not less than 0.50 watts per square foot of conditioned floor area, and using any single or combination of renewable energy generation systems meeting the requirements of Sections 610.2, 610.3, ~~or~~ 610.4, 610.5, or 610.6.

610.5 Biogas energy systems. Biogas energy systems shall be designed, constructed, and sized to provide not less than 2 percent of the total estimated annual energy consumption of the building, or collective buildings on the building site in accordance with Section 610.1.1 or 610.1.2.

610.5.1 Installation, location, and structural requirements. Biogas energy systems shall be located in the building, on the building, adjacent to the building, or on the building site.

610.5.2 On-site waste materials. Only waste materials that are produced at the building or building site shall be allowed to be used in the biogas system. Transportation of waste materials to the building or building site is prohibited.

610.5.3 Gas mixing. Biogas shall not be mixed with other fuel gases at the building or building site, except where the on-site appliances using the fuel gases are in compliance with the applicable mechanical and safety code requirements relative to the mixing of different types of fuel gases.

610.6 Biomass energy systems. Biomass energy systems shall be designed, constructed, and sized to provide not less than 2 percent of the total estimated annual energy consumption of the building, or collective buildings on the building site in accordance with Section 610.1.1 or 610.1.2.

610.6.1 Installation, location, and structural requirements. Biomass energy systems shall be located in the building, on the building, adjacent to the building, or on the building site.

610.6.2 On-site biomass materials. Only those biomass materials that are produced at the building or building site shall be used in the biomass system. Transportation of biomass materials produced at the building or building site to another building or building site is prohibited.

610.6.3 Biomass co-firing. Biomass shall not be mixed with other types of fuel at the building or building site, except where the on-site appliances using the fuel are in compliance with the applicable mechanical and safety code requirements relative to the use and mixing of biomass with other types of fuel.

Reason: Biogas and biomass are listed as renewable energy sources in the IgCC, but there is no language in Section 610 that would allow such systems to meet the renewable energy requirements of Section 610.

This code change will allow biogas and biomass systems to meet the renewable energy requirements of the code. This will allow building owners more flexibility and more options to meet the requirements, especially in areas that have poor solar and/or wind resources.

The new text provides language for on-site renewable biogas biomass systems that is consistent with the requirements for on-site renewable electric systems.

In addition, as an alternative and to be consistent with requirements shown in Section 610.4, the value could be increased to 10%, since biogas and biomass energy systems are likely to have smaller footprints (in terms of area or volume of space needed for similar energy outputs) and a higher "energy density" than other on-site renewable energy systems.

Other changes are editorial and provided to show the changes to the Section numbering.

Cost Impact: Will not increase the cost of construction. This will provide more options for building owners, and is likely to reduce the cost of meeting the renewable energy requirements of the IgCC.

GEW136-14: 610.1-ROSENSTOCK508

GEW137-14

610.1.1 (New)

Proponent: Jim Edelson, New Buildings Institute, representing NBI (edelson8@gmail.com)

Add new text as follows:

610.1.1 Renewable energy credit (REC). A renewable energy credit (REC) shall comply with all of the following:

1. Be from a renewable electricity generation facility that began operation or was repowered not earlier than 15 years prior to the date of the purchase, and represent the renewable and environmental attributes of electricity generated at that facility,
2. Not be derived from a renewable electricity generation facility that has been mandated by a local, state or federal government agency or was required under any legal requirement.
3. Not be simultaneously used to meet a local, state or federal energy mandate or other legal requirement.
4. Not represent renewable energy, renewable attributes or environmental attributes that can be legitimately claimed by another party.

Reason: The IgCC's use of Renewable Energy Credit (REC) needs additional specification. The proposed specifications for RECs reflects language that many states and regions have used to prevent double counting of RECs and "aged-out" systems producing RECs. These minimum requirements are also included in other national certifications, such as Green- E. This set of minimum quality requirements for RECs serves as a means to ensure RECs are of sufficient quality to achieve their intended objective as a trade-off for on-site renewable systems. Specifically, these quality minimums lead to additional investments in installed renewable energy generating facilities. For the instances where the model code is being adopted in jurisdictions that already have similar requirements for REC quality, such as Green-E, this proposed IgCC language is consistent with those requirements.

Cost Impact: Will not increase the cost of construction.

GEW137-14:610.1.1 (NEW)-EDELSON788

GEW138-14

610.2.3 (New)

Proponent: Edward Golden, Ascend Restoration Services, Inc., representing Ascend Restoration Services, Inc. (ed.golden@ascendrestoration.com)

Add new text as follows:

610.2.3 Roof mounted and elevated solar photovoltaic systems. The installation of roof mounted and elevated solar photovoltaic system components shall comply with Section 1013.6 of the *International Building Code*, Section 1013.7 of the *International Fire Code* and Section 304.11 of the *International Mechanical Code*.

Reason: To coordinate with the recent changes in the IBC, IFC and IMC which passed in code group A as E108-12.

There is an expanding list of equipment, assemblies, systems, devices and items that are now commonly being placed on rooftops and elevated walking surfaces that require routine maintenance. The current provisions of these sections require guards to be constructed as a method of fall protection provided for service and installation workers. This code change proposal is needed so there is correlation between IgCC, IBC, IFC and the IMC. This expands the fall protection, life safety provisions to a growing number of trades and service workers that are working on elevated walking surfaces. The proposal also provides an alternate method of compliance with the inclusion of exceptions which allow for the installation of fall arrest/restraint anchorage connector devices meeting ANSI Z359.1 which is the nationally recognized consensus general industry standard used nationally. The proposed exception is a choice made by the designer and building owner that provides design flexibility and the opportunity to lower construction cost associated with building guards. The proposal will increase the uniform application of this section of the code. The Bureau of Labor Statistics, US Department of Labor reports the fatalities due to falls for the years from 1998 to 2010 are second only to highway incidents, with an average of 743 fatalities each year over this 12 year period. Of the 635 fatal falls in 2010 one third are from falls from ladders or roofs. In 2010 the construction industry had the highest number of fatal occupational injuries. In 2010 for non fatal falls the median number of days away from work due to falls to a lower level was 14 days. Clearly the code needs to be improved to provide fall protection where mechanical equipment, appliances, fans, roof hatch openings, solar arrays, solar water heaters, photovoltaic panels, skylights, chimneys, gutters, attic vents, and ventilators, satellites dishes, antennas, television/radio/internet and other communication equipment and all other machinery and other components that require service are located on elevated surfaces more than 30 inches above lower level.

Cost Impact: Will not increase the cost of construction. The code change proposal will not increase the cost of construction because, the inclusion of exception into the IBC, IFC, and IMC provide a choice to lower the cost of construction.

GEW138-14:610.2.3 (NEW)-GOLDEN435

GEW139-14

610.4, Chapter 12

Proponent: Jim Huggins, Solar Rating & Certification Corp., representing Solar Rating & Certification Corp.

Revise as follows:

610.4 Solar water heating equipment. Not less than 10 percent of the building's annual estimated hot water energy usage shall be supplied by onsite solar water heating equipment.

The solar water heating equipment shall comply with SRCC 300. The annual estimated output of the solar water heating equipment shall be determined by an approved certification body or by using an approved, publicly available calculation program using solar collector performance information published by an approved certification body.

Add new standard as follows:

SRCC
Solar Rating & Certification Corp.,
400 High Point Drive, Suite 400,
Cocoa, FL 32926

SRCC 300-2013-09 Minimum Standards for Solar Water Heating Systems

Reason: This section requires that 10% of the building's hot water energy usage be supplied by a solar system, but does not explain how to determine the energy contribution of the solar equipment. This proposal adds a requirement to comply with the nationally recognized standard for solar thermal systems. This requirement is in the IRC, but not in the IMC or the IECC, so it is needed here to cover non-residential systems.

Certification by an approved Certification Body will provide to the design professional the information needed determine the annual estimated contribution of the solar thermal system to the building's hot water energy usage. The alternate method allows the design professional to determine the solar system's contribution using an approved calculation method.

Cost Impact: Will not increase the cost of construction. Certification of solar thermal systems is already required by incentive programs, utilities, and many states so most solar thermal systems are already certified. For those cases where the system is not certified, the alternate method provides the design professional a means to calculate the solar system output. Rather than increasing the cost of construction, this modification should lower it by make it easier for the design professional to determine compliance with the 10% requirement.

Analysis: A review of the standard proposed for inclusion in the code, SRCC 300-2013-09 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GEW139-14: 610.4-HUGGINS629

GEW140-14

610.4.1 (New)

Proponent: Edward Golden, Ascend Restoration Services, Inc, representing Ascend Restoration Services, Inc. (ed.golden@ascendrestoration.com)

Add new text as follows:

610.4.1 Roof mounted and elevated solar water heating equipment. The installation of roof mounted and elevated solar water heating system components shall comply with Section 1013.6 of the *International Building Code*, Section 1013.7 of the *International Fire Code* and Section 304.11 of the *International Mechanical Code*.

Reason: To coordinate with the recent changes in the IBC, IFC and IMC which passed in code group A as E108-12.

There is an expanding list of equipment, assemblies, systems, devices and items that are now commonly being placed on rooftops and elevated walking surfaces that require routine maintenance. The current provisions of these sections require guards to be constructed as a method of fall protection provided for service and installation workers. This code change proposal is needed so there is correlation between IGCC, IBC, IFC and the IMC. This expands the fall protection, life safety provisions to a growing number of trades and service workers that are working on elevated walking surfaces. The proposal also provides an alternate method of compliance with the inclusion of exceptions which allow for the installation of fall arrest/restraint anchorage connector devices meeting ANSI Z359.1 which is the nationally recognized consensus general industry standard used nationally. The proposed exception is a choice made by the designer and building owner that provides design flexibility and the opportunity to lower construction cost associated with building guards. The proposal will increase the uniform application of this section of the code. The Bureau of Labor Statistics, US Department of Labor reports the fatalities due to falls for the years from 1998 to 2010 are second only to highway incidents, with an average of 743 fatalities each year over this 12 year period. Of the 635 fatal falls in 2010 one third are from falls from ladders or roofs. In 2010 the construction industry had the highest number of fatal occupational injuries. In 2010 for non fatal falls the median number of days away from work due to falls to a lower level was 14 days. Clearly the code needs to be improved to provide fall protection where mechanical equipment, appliances, fans, roof hatch openings, solar arrays, solar water heaters, photovoltaic panels, skylights, chimneys, gutters, attic vents, and ventilators, satellites dishes, antennas, television/radio/internet and other communication equipment and all other machinery and other components that require service are located on elevated surfaces more than 30 inches above lower level.

Cost Impact: Will not increase the cost of construction. The code change proposal will not increase the cost of construction because, the inclusion of exception into the IBC, IFC and IMC provide a choice to lower the cost of construction.

GEW140-14:610.4.1 (NEW)-GOLDEN440

GEW 141-14 611

Proponent: Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Craig Conner, representing self (craig.conner@mac.com)

Delete without substitution:

~~611 ENERGY SYSTEMS COMMISSIONING AND COMPLETION~~

Reason: The proposal is delete all of Section 611. Most of this section is covered by provisions in the IECC.

Cost Impact: Will not increase the cost of construction. The proposal removes provisions.

GEW 141-14: 611-KLEIN1218

GEW142-14

611.1 611.1.1, 611.1.2, 611.1.2.1, 611.1.2.2, 611.1.3, 611.1.3.1, 611.1.3.2, 611.1.3.3, 611.1.4, 611.1.4.1, 611.1.4.2, 611.1.4.3, 611.1.5, 611.1.5.1, 611.1.5.2, 611.1.5.3, 611.1.5.4, 611.1.5.5, 611.2, 611.3, 611.3.1, 611.3.2, 611.3.3, 611.3.3.1, 611.3.3.2, 611.3.3.3, 611.3.3.4, 611.3.4, 611.3.5, 611.4, 611.4.1, 611.4.2, 611.4.3 (New), 611.4.5 (New), 611.5 (New), 611.6 (New), 611.7 (New), 611.7.1 (New), 611.7.2 (New), 611.7.3 (New), 611.8 (New), 611.8.1 (New), 611.9 (New), 611.9.1 (New), 611.9.2 (New), 611.9.2.1 (New), 611.9.2.2 (New), 611.9.2.3 (New), 611.9.2.4 (New), 611.9.2.5 (New), 611.10 (New), 611.10.1 (New), 611.10.2 (New), 611.10.3 (New)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IgCC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IgCC GENERAL CODE DEVELOPMENT COMMITTEE.

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

611.1 Mechanical Systems commissioning and completion requirements. ~~Within 60 days from approval conducting the final mechanical inspection, the registered design professional~~ Prior to passing the final inspection, the registered design professional or approved agency shall provide to the code official evidence of mechanical systems commissioning and completion of the mechanical system commissioned building systems installation to the code official, in accordance with the International Energy Conservation Code and provisions of this code. A Final Commissioning Report and Systems Manual shall be provided before project completion. Drawing notes ~~Construction documents shall clearly indicate provisions for commissioning and completion requirements in accordance with this section and Section 903, and are permitted to refer to specifications for further requirements. Construction documents shall list equipment and systems to be commissioned and include the location of, and performance data pertaining to, each piece of equipment and system. The construction documents shall specify that the documents prescribed in this section and Section 903 be provided to the building owner before project completion. Copies of all the documentation shall be given to the owner and made available to the code official upon request.~~

611.1.1 Commissioning plan. ~~A commissioning plan shall be developed by a registered design professional or approved agency and include as a minimum all of the following items:~~

- ~~1. A narrative describing the activities that will be accomplished during each phase of commissioning, including guidance on who accomplishes the activities and how they are completed.~~
- ~~2. Equipment and systems to be tested including, but not limited to, the specific equipment, appliances or systems to be tested and the number and extent of tests.~~
- ~~3. Functions to be tested including, but not limited to, calibrations and economizer controls.~~
- ~~4. Conditions under which the test shall be performed including, but not limited to, affirmation of winter and summer design conditions and full outside air.~~
- ~~5. Measurable criteria for performance.~~

611.1.2 Systems adjusting and balancing. ~~HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within the tolerances provided in the product specifications. Test and balance activities shall include, at a minimum, the provisions of Sections 611.1.2.1 and 611.1.2.2.~~

611.1.2.1 Air systems balancing. Each supply air outlet and zone terminal device shall be equipped with a means for air balancing in accordance with the *International Mechanical Code*. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors of 10 hp (7.35 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp (735 W), fan speed shall be adjusted to meet design flow conditions.

Exception: Fans with fan motor horsepower of 1 hp (735 W) or less.

611.1.2.2 Hydronic systems balancing. Individual hydronic heating and cooling coils shall be equipped with means for balancing and measuring flow. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the capability to measure pressure across the pump, or shall have test ports at each side of each pump.

Exceptions:

1. Pumps with pump motors of 5 hp (3677 W) or less.
2. Where throttling results in not greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.

611.1.3 Functional performance testing. Functional performance testing shall be in accordance with the requirements of Sections 611.1.3.1, 611.1.3.2 and 611.1.3.3.

611.1.3.1 Equipment. Equipment functional performance testing shall demonstrate the installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications so that operation, function, and maintenance serviceability for each of the commissioned systems is confirmed. Testing shall include all specified modes of control and sequence of operation, including under full load, part load and all of the following emergency conditions:

1. Each mode as described in the sequence of operation.
2. Redundant or automatic backup mode.
3. Performance of alarms.
4. Mode of operation upon a loss of power and restoration of power.

611.1.3.2 Controls. HVAC control systems shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operated in accordance with the approved plans and specifications. Sequences of operation shall be functionally tested to document that they operate in accordance with the approved plans and specifications.

611.1.3.3 Economizers. Air economizers shall undergo a functional test to determine that they operate in accordance with the manufacturer's specifications.

611.1.4 Preliminary commissioning report. A preliminary report of commissioning test procedures and results shall be completed and certified by the *registered design professional* or approved agency and provided to the building owner. The report shall be identified as "Preliminary Commissioning Report" and shall identify all of the following:

1. Itemization of deficiencies found during testing required by this section that have not been corrected at the time of report preparation.
2. Deferred tests that cannot be performed at the time of report preparation because of climatic conditions.
3. Climatic conditions required for performance of the deferred tests.

~~**611.1.4.1 Acceptance.** Buildings, or portions thereof, shall not pass the final mechanical inspection until such time as the *code official* has received a letter of transmittal from the building owner acknowledging that the building owner has received the Preliminary Commissioning Report.~~

~~**611.1.4.2 Copy.** At the request of the *code official*, a copy of the Preliminary Commissioning Report shall be made available for review.~~

~~**611.1.4.3 Certification.** A certification, signed and sealed by the *registered design professional*, documenting that the mechanical and service water heating systems comply with Sections C403 and C404 of the *International Energy Conservation Code*, shall be provided to the *code official*.~~

~~**611.1.5 Completion requirements** The construction documents shall specify that the requirements described in this section be provided to the building owner within 90 days of the date of receipt of the certificate of occupancy.~~

~~**611.1.5.1 Drawings.** Construction documents shall include the location of and performance data pertaining to each piece of equipment.~~

~~**611.1.5.2 Manuals.** An operating and maintenance manual in accordance with industry accepted standards shall be provided and shall include all of the following:~~

- ~~1. Submittal data stating equipment size and selected options for each piece of equipment requiring maintenance.~~
- ~~2. Manufacturer's operation manuals and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the building project. Required routine maintenance shall be clearly identified.~~
- ~~3. Names and addresses of not less than one service agency.~~

~~A systems manual shall be provided and shall include all of the following:~~

- ~~1. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems, in programming comments.~~
- ~~2. A complete narrative of how each system is intended to operate, including recommended setpoints, seasonal changeover information and emergency shutdown operation.~~
- ~~3. Control sequence descriptions for lighting, domestic hot water heating and all renewable energy systems complete with a description of how these systems connect to, and are controlled in conjunction with, the overall building system.~~

~~**611.1.5.3 System balancing report.** A written report describing the activities and measurements completed in accordance with Section 611.1.2 shall be provided.~~

~~**611.1.5.4 Final commissioning report.** A complete report of test procedures and results identified as "Final Commissioning Report" shall be completed and provided to the building owner. The report shall include all of the following:~~

- ~~1. Results of all functional performance tests.~~
- ~~2. Disposition of all deficiencies found during testing, including details of corrective measures used or proposed.~~
- ~~3. All functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.~~

~~**Exception:** Deferred tests that were not performed at the time of report preparation because of climatic conditions.~~

~~**611.1.5.5 Post-occupancy recommissioning.** The commissioning activities specified in Sections 611.1.2 through 611.1.5 shall be repeated 18 to 24 months after certificate of occupancy. Systems and control devices that are not functioning properly shall be repaired or replaced. Adjustments to calibration settings shall be documented. This documentation shall be provided to the building owner.~~

~~**611.2 Sequence of operation Commissioning plan.** A sequence of operation shall be developed and finalized upon commissioning, when the operational details are initialized and validated. A sequence of operation shall be the final record of system operation, and shall be included on the control diagram "as" or as part of the education and operation and maintenance document that is provided to the owner.~~

A commissioning plan shall be developed for the systems specified in the construction documents to be commissioned by a registered design professional or approved agency and shall be assembled in accordance with Section 903.3.

~~**611.3 Lighting and electrical systems commissioning and completion requirements. Functional and performance testing.** Prior to issuance of a certificate of occupancy, the *registered design professional* shall provide evidence of lighting and electrical systems commissioning and completion in accordance with the *International Energy Conservation Code* and the provisions of this section.~~

~~Drawing notes shall specify the provisions for commissioning and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documentation shall be given to the owner and made available to the *code official* upon request in accordance with Sections 611.2.4 and 611.2.5~~

Functional and performance testing shall be performed in accordance with the requirements of Sections 611.3.1, 611.3.2 and 611.3.3.

~~**611.3.1 Preconstruction documentation, lighting. Equipment.** Construction and owner education documents shall include floor plans, diagrams and notations of sufficient clarity describing the types of, location and operational requirements of all lighting controls including a sequence of operation and preliminary intended setpoints for all dimming systems and automatic *daylight controls*, demonstrating conformance to the provisions of this code, relevant laws, ordinances, rules and regulations, as *approved by the code official*.~~

Equipment functional and performance testing shall demonstrate that the installation and operation of components, systems, and system-to-system interfacing relationships is in accordance with *approved plans and specifications* so that operation, function, performance and maintenance serviceability for each of the commissioned systems is confirmed. Testing shall include all specified modes of control and sequence of operation, including under full-load, part-load and all of the following emergency conditions:

1. Each mode as described in the sequence of operation.
2. Redundant or automatic backup mode.
3. Performance of alarms.
4. Mode of operation upon a loss of power and restoration of power.

~~**611.3.2 Verification. Controls.** The approved agency conducting commissioning shall verify that controls have been installed in accordance with the *approved construction documents*. Any discrepancies shall be reviewed for compliance with Section 608 and the requirements of Section C405.2 of the *International Energy Conservation Code*.~~

Control systems shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operated in accordance with the *approved plans and specifications*.

611.3.3 Commissioning—Sequence of operation. ~~Lighting controls shall be commissioned in accordance with this section. The sequence of operation shall be verified to document that the sequence operates in accordance with the approved plans and specifications. This verified sequence of operation shall be the final record of system operation, and shall be included on the control “record documents,” and as part of the education and Systems Manual operation and maintenance document that is provided to the owner.~~

611.3.3.1 Occupant sensors. It shall be verified that the functional testing in accordance with Section C405.2 of the *International Energy Conservation Code* has been performed.

611.3.3.2 Automatic daylight controls. Automatic *daylight controls* shall be commissioned in accordance with all of the following:

1. It shall be verified that the placement and orientation of each sensor is consistent with the manufacturer’s instructions. If not, the sensor shall be relocated or replaced.
2. Control systems shall be initially calibrated to meet settings and design intent established in the construction documents.
3. Prior to calibration of systems controlling dimmable luminaires, all lamps shall be seasoned in accordance with the recommendations of the lamp manufacturer.
4. Where located inside buildings, calibration of open-loop *daylight controls*, which receive illumination from natural light only, shall not occur until fenestration shading devices such as blinds or shades have been installed and commissioned.
5. Calibration of closed-loop *daylight controls*, that receive illumination from both natural and artificial light, shall not occur until furniture systems and interior finishes have been installed, and any fenestration shading devices such as blinds or shades have been installed and commissioned.
6. Calibration procedures shall be in accordance with the manufacturer’s instructions.

611.3.3.3 Time switch and programmable schedule controls. Lighting controls installed in accordance with Section 608 shall be programmed. Scheduling shall incorporate weekday, weekend and holiday operating times, including leap year and daylight savings time corrections. It shall be verified that system overrides work and are located in compliance with Section C405.2 of the *International Energy Conservation Code*.

611.3.3.4 Dimming systems with preset scenes. For programmable dimming systems, it shall be verified that automatic shutoff and manual overrides are working and that programming is complete. Prior to programming, the lamps shall be seasoned in accordance with NEMA LSD 23.

611.3.4 Post-commissioning documentation. The following documentation shall be provided to the building owner in accordance with Section 903.

1. Settings determined during commissioning activities outlined in Section 611.3.3.
2. A narrative describing the intent and functionality of all controls including any capability for users to override a schedule or master command.
3. Specification sheets for all lighting equipment and controls.
4. Operation manuals for each lighting control device. Required maintenance and maintenance schedules shall be clearly identified. Documentation and instructions necessary for building maintenance personnel to maintain and recalibrate lighting systems and controls.
5. An annual inspection schedule for lighting controls.
6. Troubleshooting information for fluorescent dimming systems and the remediation of switching issues such as false-ons and false-offs.

611.3.5 Post-occupancy recommissioning. ~~The commissioning activities in Section 611.3.3 shall be repeated 18 to 24 months after issuance of the certificate of occupancy. Control devices that are not functioning properly shall be repaired or replaced. Adjustments to calibration settings shall be documented. This documentation shall be provided to the building owner.~~

611.4 Building envelope systems commissioning and completion requirements. Pre-certificate of occupancy commissioning report. ~~Prior to issuance of a certificate of occupancy, the registered design professional shall provide evidence of building thermal envelope systems commissioning and completion to the building owner in accordance with the International Energy Conservation Code and the provisions of this section.~~

~~Construction documents shall specify the provisions for commissioning and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documentation shall be given to the building owner and made available to the code official upon request in accordance with Sections 611.4.1 and 611.4.2.~~

A pre-certificate of occupancy report of commissioning test procedures and results shall be completed and certified by the registered design professional or approved agency and shall be provided to the building owner prior to final inspection. The report shall be identified as "Pre-Certificate of Occupancy Commissioning Report" and shall be assembled in accordance with Section 903.4.1

611.4.1 Preconstruction documentation, building thermal envelope. Acceptance. ~~Construction and owner education documents shall indicate the location, nature and extent of the work proposed and show the functional requirements and operation of all building thermal envelope systems demonstrating conformance to the provisions of this code, relevant laws, ordinances, rules and regulations, as approved by the code official.~~

Buildings, or portions thereof, shall not pass the final mechanical inspection until such time as the code official has received a letter of transmittal from the building owner acknowledging that the building owner has received the Pre-Certificate of Occupancy Commissioning Report.

611.4.2 Verification Copy available for review. ~~The approved agency conducting commissioning shall verify that building thermal envelope systems have been installed in accordance with the approved construction documents. Any discrepancies shall be reviewed for compliance with requirements of the International Energy Conservation Code and this code.~~

At the request of the code official, a copy of the Pre-Certificate of Occupancy Commissioning Report shall be made available for review.

611.4.3 Verification. The approved agency conducting commissioning shall verify that commissioned systems have been installed and perform in accordance with the approved construction documents. Any discrepancies shall be reviewed for compliance with requirements of the International Energy Conservation Code and this code.

611.4.5 Manuals A Systems Manual assembled in accordance with industry-accepted standards and Section 903.6.1 shall be provided to the owner before project completion.

611.5 Final Commissioning Report. A complete report of accomplishment of the commissioning plan including test procedures and results identified as "Final Commissioning Report" shall be completed in accordance with Section 903.5.1 before project completion and shall be provided to the building owner.

611.6 Commissioning completion. The commissioning activities specified in the commissioning plan including delayed testing shall be completed and documented before project completion. Equipment and systems repaired or replaced and adjustments to set-points and calibration settings shall be documented in the record sequence of operation and in Systems Manual updates. These documentations shall be provided to the building owner.

611.7 HVAC commissioning. HVAC equipment and systems shall be commissioned in accordance with the IECC and this section using recognized commissioning standards, as approved.

611.7.1 Mechanical systems adjusting and balancing. HVAC systems shall be tested, adjusted and balanced in accordance with generally accepted standards, as approved. Air and water flow rates shall be measured and adjusted to deliver final flow rates within the tolerances provided in the construction documents. Test and balance activities shall include the provisions of Section C408.2.2 of the *International Energy Conservation Code* except that the exceptions to Section C408.2.2 shall not apply. A written report describing the test and balance activities and measurements completed shall be provided with the final Systems Manual.

611.7.2 HVAC system operations. HVAC equipment and systems commissioning shall include testing and balancing verification including adjustment of temperatures, flows, and sequence of operation.

611.7.3 HVAC economizers. Air and water economizers shall undergo a functional test to determine that they operate in accordance with the manufacturer's specifications and perform to project requirements.

611.8 Domestic hot water system commissioning. Domestic hot water equipment and systems shall be commissioned in accordance with this section and the construction documents.

611.8.1 Domestic hot water system operations. Domestic hot water equipment and systems commissioning shall include verification and adjustment of temperatures, flows, and sequence of operation.

611.9 Lighting and electrical systems commissioning. Lighting, lighting controls, plug load controls and electrical systems commissioning shall be completed in accordance with the *International Energy Conservation Code* and the provisions of this section.

611.9.1 Preconstruction documentation, lighting. Construction and owner education documents shall include floor plans, diagrams and notations of sufficient clarity describing the types of, and location and operational requirements of the lighting controls including a sequence of operation, schedules and preliminary intended set-points for area controls, dimming systems and automatic daylight controls, demonstrating conformance to the provisions of the construction documents and this code, as approved by the code official.

611.9.2 Lighting controls commissioning. Lighting controls shall be commissioned in accordance with this section.

611.9.2.1 Occupant sensors. It shall be verified that the functional testing in accordance with Section C405.2 of the *International Energy Conservation Code* has been performed.

611.9.2.2 Automatic daylight controls. Automatic daylight controls shall be commissioned in accordance with all of the following:

1. It shall be verified that the placement and orientation of each sensor is consistent with the manufacturer's and designer's instructions. If not, the sensor shall be relocated or replaced.
2. Control systems shall be initially calibrated to meet settings and design intent established in the construction documents.
3. Prior to calibration of systems controlling dimmable luminaires, the lamps shall be seasoned in accordance with the recommendations of the lamp manufacturer in accordance with NEMA LSD 23.
4. Where located inside buildings, calibration of open-loop daylight controls, that receive illumination from natural light only, shall not occur until fenestration shading devices such as blinds or shades have been installed and commissioned.

5. Calibration of closed-loop daylight controls, that receive illumination from both natural and artificial light, shall not occur until furniture systems and interior finishes have been installed, and any fenestration shading devices such as blinds or shades have been installed and commissioned.
6. Calibration procedures shall be in accordance with the manufacturer's instructions.

611.9.2.3 Time switch and programmable schedule controls. Lighting controls installed in accordance with Section 608 shall be programmed and commissioned. Scheduling shall incorporate weekday, weekend and holiday operating times, including leap year and daylight savings time corrections. It shall be verified that system overrides work and are located in compliance with Section C405.2 of the *International Energy Conservation Code*.

611.9.2.4 Dimming systems with preset scenes. For programmable dimming systems, it shall be verified that automatic shutoff and manual overrides are working and that programming is complete. Prior to programming, the lamps shall be seasoned in accordance with NEMA LSD 23.

611.9.2.5 Lighting documentation. The following documentation for lights, systems and control devices shall be provided to the building owner:

1. Settings determined during commissioning activities outlined in Section 611.9.2
2. A narrative describing the intent and functionality of all controls including any capability for users to override a schedule or master command.
3. Specification sheets for all lighting equipment and controls.
4. Operation manuals for each lighting control device. Required maintenance and maintenance schedules shall be clearly identified. Documentation and instructions necessary for building maintenance personnel to maintain and recalibrate lighting systems and controls.
5. An annual inspection schedule for lighting controls.
6. Troubleshooting information for dimming systems and the remediation of switching issues such as false-ons and false-offs.

611.10 Building envelope systems commissioning, Building thermal envelope, dynamic glazing and shading device systems shall be commissioned and completion documentation shall be provided to the building owner in accordance with the *International Energy Conservation Code* and the provisions of this section.

611.10.1 Preconstruction documentation, building thermal envelope. Construction and owner education documents shall indicate the location, nature and extent of the work proposed and show the functional requirements and operation of the building thermal envelope, dynamic glazing and shading device systems demonstrating conformance to the provisions of this code.

611.10.2 Continuous air barrier commissioning. Prior to final inspection, the *registered design professional* or approved agency shall provide evidence of *continuous air barrier commissioning* that shall include:

1. Clear identification of the *continuous air barrier* components specified for the project and identified on approved construction documents
2. Review of planned construction details to ensure continuity of the air barrier over the entire *building thermal envelope*.
3. A field inspection checklist clearly showing the requirements necessary for proper installation of the *continuous air barrier*.
4. Witnessing and reporting on any *continuous air barrier* testing specified by the owner.
5. Periodic field inspections over the course of project construction to ensure compliance with the *continuous air barrier* requirements including but not limited to proper material handling and storage, use of approved materials and approved substitutes, proper material and surface preparation, air barrier continuity at all *building thermal envelope* penetrations and other

requirements as necessary for achieving the performance objective of the continuous air barrier.

6. A final commissioning report provided to the building owner and code official demonstrating compliance with the continuous air barrier requirements.

611.10.3 Continuous air barrier commissioning report. A final commissioning report shall be delivered to the building owner, and shall include:

1. A field inspection checklist showing the requirements necessary for proper installation of the continuous air barrier.
2. The results of any building air leakage testing
3. Reports from field inspections during project construction showing compliance with continuous air barrier requirements including but not limited to proper material handling and storage, use of approved materials and approved substitutes, proper material and surface preparation and air barrier continuity at building thermal envelope penetrations.

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

This proposal is the first part of a two part proposal to separate the process of commissioning from the systems and building elements which must be observed, reviewed and found in compliance during the commissioning process. This change removes the process elements of commissioning, the second change – or Part II of this proposal will be to add a comprehensive process to Chapter 9 of this code. Thus, this proposal specifies the systems and building elements which need to be commissioned and the key things to be reviewed, the functions to be observed to verify that the installed systems are in compliance with the code. Chapter 9 will address the process of doing the commissioning including the specific reporting requirements.

Cost Impact: Will increase the cost of construction. While the vast majority of this proposal is editorial. New provisions for air barrier commissioning will add to the overall cost of the commissioning process.

GEW142-14: 611.1-THOMPSON1022

GEW143-14

611.1

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

Revise as follows:

611.1 Mechanical systems commissioning and completion requirements. Within 60 days from approval ~~conducting~~ of the final mechanical inspection, the *registered design professional* shall provide evidence to the code official that installation and commissioning of mechanical systems has been completed ~~commissioning and completion of the mechanical system installation to the code official~~, in accordance with the *International Energy Conservation Code*.

Drawing notes shall clearly indicate provisions for commissioning and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documentation shall be given to the owner and made available to the *code official* upon request.

Reason: This is an editorial proposal to simplify and improve the readability of this section.

Cost Impact: Will not increase the cost of construction.

GEW143-14: 611.1-TRAXLER620

GEW144-14

611.1.4.1

Proponent: Kathleen Petrie, City of Seattle, WA, representing City of Seattle, Department of Planning and Development (kathleen.petrie@seattle.gov)

Delete without substitution:

~~**611.1.4.1 Acceptance.** Buildings, or portions thereof, shall not pass the final mechanical inspection until such time as the *code official* has received a letter of transmittal from the building owner acknowledging that the building owner has received the Preliminary Commissioning Report.~~

Reason: As written, Section 611.1.4.1 does not add value to the enforcement process. Section 611.1.4 requires the preliminary commissioning report to be given to the owner and Section 611.1.4.2 states that a copy of the report be made available to the code official upon request, so Section 611.1.4.1 creates a layer of redundancy in the process. If the purpose of this section is to delay the final inspection in order to ensure that the contractor has dealt with any system deficiencies, then that is a contract negotiation between the owner and contractor.

Cost Impact: Will not increase the cost of construction.

GEW144-14: 611.1.4.1-PETRIE474

GEW145-14

611.1.5.5

Proponent: Barry Greive, Target Corporation, representing Target Corporation
(barry.greive@target.com)

Revise as follows:

611.1.5.5 Post-occupancy recommissioning. Where there is not an actively monitored and managed energy management and control system, the commissioning activities specified in Sections 611.1.2 through 611.1.5 shall be repeated 18 to 24 months after issuance of the certificate of occupancy. Systems and control devices that are not functioning properly shall be repaired or replaced. Adjustments to calibration settings shall be documented. This documentation shall be provided to the building owner.

Reason: Systems with an EMCS are continuously monitored and essentially commissioning is done 24/7, reports stating how the system is functioning can be given to the Building Official if requested. Requiring post commissioning on EMCS structures is redundant and a miss use of resources.

Cost Impact: Will not increase the cost of construction.

GEW145-14: 611.1.5.5-GREIVE1012

GEW146-14

601.3, 601.3.3 (New), 612 (New), 612.1 (New), 612.2 (New), 612.2.1 (New), 612.2.2 (New), 612.2.3 (New), 612.2.4 (New), 612.3 (New), 612.3.1 (New), 612.3.2 (New), 612.3.3 (New), 612.3.4 (New), 612.3.5 (New)

Proponent: Duane Jonlin, City of Seattle, WA, representing Seattle Department of Planning and Development (duane.jonlin@seattle.gov)

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 601.3.1, or Section 601.3.2 or Section 601.3.3.

601.3.3 Operational energy use confirmation. Buildings shall comply with Sections 603, 610, 611, 612 and the total building performance compliance path in Section C407 of the *International Energy Conservation Code*.

612 OPERATIONAL ENERGY USE CONFIRMATION

612.1 Operational energy use limit. Buildings shall be designed according to total building performance criteria of Section C407 of the *International Energy Conservation Code*. The annual energy cost calculated for the *proposed design* shall be less than 85 percent of annual energy cost calculated for the *standard reference design*.

612.2 Demonstration period for operating energy use. The actual energy cost of the occupied building shall be less than 85 percent of annual energy cost calculated for the *standard reference design* for at least one 12-month recording period concluding within three years of the date of issuance of the Certificate of Occupancy.

The building shall be at least 75 percent occupied during the recording period. The energy cost for the *standard reference design* shall be adjusted according to Section 612.3. The owner shall notify the *code official* when this 12-month recording period has been successfully completed. The owner shall submit to the code official either certified copies of the utility bills for the recording period or a Portfolio Manager Energy Performance Report. The documentation shall indicate the occupancy type for each building tenant, the amount of conditioned floor area occupied by that tenant and the calendar time period during which that area of the building was occupied.

612.2.1 Issuance of temporary certificate of occupancy. Upon the satisfaction of the code official of compliance with all code provisions other than Section 612, the code official shall issue a *Temporary Certificate of Occupancy* according to Section 111.3 of the *International Building Code*.

612.2.2 Certificate of occupancy. Upon compliance with the provisions of Section 612.2, the *building* shall be issued a *Certificate of Occupancy*.

612.2.3 Non-compliance. Where the building fails to comply with Section 612.2, a notice of violation shall be issued.

612.2.4. Extension of demonstration period. For good cause, including conditions where less than 75 percent of the building is occupied, the *code official* is authorized to extend the demonstration period for one additional year. If the building is not at least 75 percent occupied after three additional one-year periods, the *code official* shall evaluate compliance with Section 612.2 based on the most recent one-year period and adjusted for the actual occupancy rate during that period.

612.3 Modifications for actual operating conditions. Where the operating conditions of the occupied building differ from those used for Total Building Performance calculations during the recording period, the *standard reference design* shall be modified according to the applicable provisions of Sections 612.3.1 through 612.3.5 and compliance shall be based upon the revised *standard reference design*.

612.3.1 Adjustment for change in use or occupancy. Where the use or occupancy of the building or a portion of the building changes from that identified in the permit submittal, the assigned energy performance target shall be adjusted to reflect the new occupancy.

612.3.2 Optional adjustment for change in occupancy characteristics. Where the actual occupant density, plug load density, operating hours or other occupancy characteristics are substantially different from those assumed in the *standard reference design*, the *standard reference design* is permitted to be revised to reflect those actual occupancy characteristics, subject to approval of the code official.

612.3.3 Optional adjustment for change in process loads. Where actual process loads are substantially different from those assumed in the *standard reference design*, the *standard reference design* is permitted to be revised to reflect the actual process loads, subject to approval of the code official.

612.3.4 Adjustment for partial occupancy. Where a portion of the floor area of the building is unoccupied during the demonstration period, the *standard reference design* shall be revised to reflect a weighted monthly average of the actual percentage of floor area occupied.

612.3.5 Adjustment for utility cost changes. Where the unit energy costs differ from the costs used in the *standard reference design*, the *standard reference design* shall be revised accordingly.

Reason: This proposal provides an optional compliance pathway ensuring that the building functions optimally when it is fully occupied and operating, essentially extending the concept of “commissioning” into that time period.

Using this pathway, a motivated building owner will be provided with a straightforward means to focus the whole project development team on the actual energy use, rather than just the energy model. It can be difficult and time-consuming to determine the cause of sub-par performance, in which case the issue is often simply dropped. Such performance problems might be due to design errors, construction defects, malfunctioning equipment or controls, incorrect system settings, operator errors, or occupant use of the space, but with traditional code compliance methods no one has responsibility to go looking for the cause, or even to know that the building is performing poorly.

The energy use limits in this pathway are determined using the IECC “Total Building Performance” modeling protocol, which limits modeled energy use to 85 percent of the “standard reference design.” The building must operate within its calculated energy limit for a 12-month period sometime during the first three years after construction. Buildings following this protocol are likely to perform significantly better than comparable buildings that simply begin operations without any further tracking or evaluation.

By using standardized IECC energy modeling protocol, rather than CBECS-based targets, this proposal provides a more nuanced standard, specific to the building and local climate. It is “energy cost” based, which allows use of the same energy model as the IECC, and greatly simplifies compliance verification for code officials – the code official simply looks at the certified utility bills.

A building that “really” performs at high level is far more important than an energy model or code compliance pathway that “theoretically” performs at a high level. Attaining such performance is important to society, and important to the owner who paid for that performance.

Cost Impact: Will not increase the cost of construction. Because it is an optional compliance path, this proposal does not increase the cost of construction.

GEW146-14: 612 (NEW)-JONLIN992

GEW147-14

601.3, 601.3.3 (New), 603.2.2 (New), 610.1.1, 612 (New), 612.1 (New), 612.1.1 (New), 612.1.2 (New), 612.1.2.1(New), 612.1.3 (New), 612.2 (New), 612.2.1 (New), 612.3(New), 612.3.1 (New), 612.3.2 (New), 612.3.3 (New), 612.3.4 (New)

Proponent: Ryan Colker, National Institute of Building Sciences, representing National Institute of Building Sciences (rcolker@nibs.org)

Revise as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section 601.3.1, Section 601.3.2 or 601.3.3.

601.3.3 Outcome-based compliance. Buildings designed on an outcome basis shall comply with Sections 612, 603, 610, and 611 and the *International Energy Conservation Code*.

603.2.2 Onsite nonrenewable energy. For the purpose of determining compliance with the provisions of Section 603.2, the CO₂e emissions associated with onsite non-renewable energy use shall be calculated in accordance with Section 602.2.2.

610.1.1 Building performance-based and outcome-based compliance. Buildings and surrounding property or building sites where there are multiple buildings on the building site, that are designed and constructed in accordance with Section 601.3.1, performance-based compliance or Section 612.3 Outcome-based compliance, shall be equipped with one or more renewable energy systems that have the capacity to provide not less than 2 percent of the total calculated annual energy use of the building, or collective buildings on the site.

612 OUTCOME-BASED PATHWAY REQUIREMENTS.

612.1 Outcome-based requirements. Compliance for buildings and their sites to be designed on an outcome basis shall be determined by actual measurement of all the energy being used once the building and the energy using elements associated with the building site are in full operation in accordance with Equation 6-3. Where a building has multiple occupancy types, the maximum allowable energy use shall be based on total gross floor area of each occupancy type in relation to the total gross floor area of all occupancy types within the building. Buildings and building sites complying with this section shall also comply with the *International Energy Conservation Code*. Compliance shall be based on a determination of actual energy use in accordance with this section.

Exception: Buildings having one or more uses or occupancies not listed in Table 612.1 or where a mixed use building in accordance with the *International Building Code* includes any occupancies not shown in Table 612.1, shall not be eligible to demonstrate compliance with this code in accordance with Section 612.

**TABLE 612.1
REFERENCE ANNUAL ENERGY USE INDEX (EUIr)**

Climate zone ^a	1A	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	6A	6B	7	8
Use and Occupancy ^b	Reference EUIr skBtu/sf/yr														
Business (B)															
Office	154	159	154	151	140	137	167	144	152	179	155	190	176	208	282
Bank	154	159	154	151	140	137	167	144	152	179	155	190	176	208	282
Medical office (non-	115	118	115	113	104	102	125	108	114	134	116	148	131	156	210

Climate zone ^a	1A	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	6A	6B	7	8
diagnostic)															
Storage (S-2)															
Distribution/ Shipping Center	105	67	69	66	64	55	75	70	66	87	81	104	95	119	186
Mercantile (M)															
Grocery/ Food Store	448	476	452	484	450	473	522	479	514	554	511	592	561	633	758
Assembly (A)															
Library (A-3)	234	232	224	230	217	209	254	228	235	275	246	304	277	327	434
Educational (E)															
Elementary/ Middle School	140	139	134	134	128	124	149	132	132	160	141	182	161	193	274
Institutional (I-2)															
Hospital/ Inpatient health	417	422	397	408	388	407	425	366	398	425	374	439	394	446	532

a Climate zones as determined in accordance with by Section C301 of the *International Energy Conservation Code*.

b. Use and occupancy as determined by Chapter 3 of the *International Building Code*.

612.1.1 zEPI. All outcome-based designs shall demonstrate a zEPI of not more than 51 as determined in accordance with Equation 6-3.

$$zEPI = 100 (EUI_a / EUI_r)$$

(Equation 6-3)

Where:

EUI_a = the Actual Annual Energy Use Index for the *building* and *building site* expressed in accordance with Section 612.1.2 and Equation 6-4.

EUI_r = the Reference Annual Energy Use Index for the *building* use and occupancy in Table 612.1 as adjusted by Section 612.1.3 where applicable

612.1.2 Actual energy use intensity (EUIa). The actual energy use intensity (EUIa) of the *building* and *building site* shall be expressed in accordance with this section. On-site renewable energy generation in excess of the generation requirements of Section 610 shall be included in the calculation of the EUIa.

The EUI_a shall be determined in accordance with Equation 6-4 and Sections 612.1.2.1.

$$EUI_a = (AEU_{consumption} - AEU_{renewable})/TCFA \quad \text{(Equation 6-4)}$$

Where:

EUI_a = the energy use intensity of the *building* and *building site*

$AEU_{consumption}$ = the annual energy consumed by the building and building site from all forms of energy specified in Sections 603.3.1 through 603.3.6 and converted to source Btus in accordance with Sections 602.1.2.2 and 602.1.2.3.

$AEU_{renewable}$ = the annual energy produced by *onsite renewable energy systems* in excess of the production required by Section 610 and converted to source Btus by multiplying onsite Btu production by a factor of 1.

TCFA = the total conditioned floor area of the building

612.1.2.1 Measurement of AEU's. The AEU's shall be determined from metering, utility billing or other form of measurement in accordance with Section 603.

612.1.3 Reference energy use intensity (EUIr). The reference energy use intensity shall be determined utilizing Table 612.1. The EUIr value from Table 603.1 shall be adjusted based on the monthly weighted average percentage of occupied floor area during the 12-month compliance period as documented in accordance with 612.3.2. For buildings with multiple use or occupancy designations in Table 612.1, the EUIr shall be adjusted based on the weighted area average of the use or occupancy.

612.2 Annual direct and indirect CO₂e emissions. The emissions associated with the EUIa shall be less than or equal to the CO₂e emissions associated with the CO₂e emissions in accordance with the EUIr determined in Section 612.1.3. The CO₂e emissions calculations for the building and building site shall be determined in accordance with Sections 612.2.1 and 612.2.2 and Equation 6-5.

$CO_{2,ea} \leq (CO_{2,er} \times zEPI) / 100$ **(Equation 6-5)**

where:

zEPI = the minimum score as prescribed by Section 612.1.1

CO_{2,ea} = emissions associated with the EUIa of the building as determined in accordance with Section 612.1.2

CO_{2,er} = emissions associated with the EUIr as determined in accordance with Section 612.1.3

612.2.1 Onsite electricity. For the purpose of determining compliance with the provisions of Section 612.2, the CO₂e emissions associated with onsite electricity use shall be calculated in accordance with Section 602.2.1.

612.3 Compliance. Compliance with Section 612 shall be determined in accordance with Sections 612.3.1 through 612.3.4

612.3.1 Issuance of temporary certificate of occupancy. Where the code official determines a building and its site are in compliance with this code other than Section 612, the code official shall issue a Temporary Certificate of Occupancy as authorized in Section 111.3 of the *International Building Code*.

612.3.2 Reporting of energy use and CO₂e emissions. Within 36 months of issuance of the temporary certificate of occupancy, the building owner shall provide the code official with documentation, in a form acceptable to the code official and certified by a registered design professional, of a continuous 12-month period where the building complies with Sections 612.1 and 612.2. The occupancy or use type for the occupied period utilized in Section 612.1.3 shall be indicated in the documentation and include the time periods and square footage of the building occupied by all building tenants.

612.3.3 Certificate of occupancy. Upon compliance with Section 612.3.2, the building shall be issued a Certificate of Occupancy.

612.3.4 Non-compliance. Should the building owner fail to comply with Section 612.3.2, the owner shall be deemed non-compliant and be issued a violation.

Reason: This proposal for the establishment of an outcome-based approach to compliance with energy requirements is intended to address numerous issues impacting code departments, designers, building owners and energy efficiency advocates. To address these diverse needs, stakeholders representing these segments of the industry have come together to begin addressing

these issues. While discussed in greater depth below, the following list represents some of the challenges addressed by this proposal:

Code departments have limited resources available to enforce building codes—particularly energy codes.

Energy use is highly measurable yet current code pathways anticipate results from designs, not actual building performance.

Designers often do not have the flexibility to use the latest technologies in achieving energy efficiency requirements.

Effectively capture all energy saving strategies including those not currently covered under the IECC including building orientation.

Reducing energy use at the systems level is required but this approach has not been handled effectively in the IECC.

Energy uses not covered within the existing code framework (i.e., plug loads) are a growing percentage of energy use associated with buildings.

For 35 years, since the first energy codes, there has been no consideration in the codes for how buildings actually perform – only criteria prescribing how they are to be designed and constructed. The provisions in virtually all energy codes and standards are based on a number of prescribed criteria that must be satisfied by specific products, materials and components of a building. The closest these documents come to actual performance of a building is a simulation of how a building as designed is expected to perform compared to the same identical building but assumed to just meet the provisions in the code. In effect, this creates a custom energy budget for each and every building based on a prescriptive foundation.

Unfortunately, many of those criteria do not allow for application of new technologies such as innovative window materials or creative design approaches such as passive solar, building form and shape, and orientation. In order to establish an actual EUI (EUIa) for a building the code must provide a methodology for measuring and expressing the energy use of a building and subsequently be able to compare it to the target reference EUI (EUIr) as part of the compliance verification process.

The purpose of this section is to allow the design team in conjunction with the owner/developer the freedom to achieve a common and uniform objective that applies equally, without exception, to all buildings of the same type and in the same climate zone – something not included in current energy codes and standards. The significance of actual validation of achieving that objective is through measurement of actual building operation as it is intended to be occupied. Energy simulation is part of the current models, but such modeling is not known as a good predictor of actual energy performance. It is an appropriate comparison of the merits of different design considerations.

This proposed outcome procedure is unique and offers communities the option to gain valuable experience and knowledge with a method and accurate results far beyond the traditional procedures of design for energy conservation. An analogy can be made between the outcome based requirements for a building to the purchase and use of an automobile. When purchasing a vehicle you are given information about the vehicle's performance in its specifications and the mileage that is anticipated for its operation. However, your personal performance and mileage may be quite different. Only by checking the actual mileage can you know whether what was stated is being achieved.

Similarly, under traditional energy codes and standards, when the building is completed and is occupied there is no way to know whether the decisions for a specific design or material or orientation resulted in actual energy savings. This proposed outcome approach provides a real target, allows design options and flexibility and then provides real answers as to whether what was planned has been achieved in a way that has never been done before.

An outcome-based framework accommodates actual conditions in existing buildings better than prescriptive or modeled-performance approaches. Owners of existing buildings are allowed to invest in a strategy that achieves performance improvements without specifically having to meet code minimums which may not reflect how the building was originally constructed. Outcome-based pathways allow for designs to incorporate operations and management or tenant behavior.

In addition to the National Institute of Building Sciences, this proposal is supported by:

- New Buildings Institute
- Institute for Market Transformation
- Colorado Chapter, International Code Council

SECTION-BY-SECTION ANALYSIS FOR OUTCOME-BASED PATHWAY PROPOSAL TO INTERNATIONAL GREEN CONSTRUCTION CODE

Edits in Existing Sections:

601.3 Establishes the outcome-based pathway as an acceptable method for compliance with the *Energy Conservation, Efficiency and CO₂e Emission Reduction* chapter of the IgCC.

601.3.3 Defines the provisions to be applied when pursuing the Outcome-based pathway, including setting the International Energy Conservation Code as a minimum requirement.

610.1.1 Like in the performance-based pathway, the outcome-based pathway requires a building to have renewable energy systems onsite that can produce at least 2 percent of the annual building energy use.

New Section 612 Establishing Outcome-Based Pathway Requirements

612.1 Establishes the outcome-based pathway as an actual measurement of energy use once in full operation. For buildings with multiple occupancy types, the gross floor area of each type is used to determine compliance. If an occupancy type is not included in the table then this pathway cannot be used.

612.1.1 Establishes the equation to be used in determining the target energy use. The target is based on the ratio of a building's actual energy use to a reference value provided in Table 60X.1. The actual use should be 51 percent or better than the values in the table. The table is based on data from the 2003 Commercial Buildings Energy Consumption Survey conducted by the U.S. Department of Energy's Energy Information Administration. The equation is based on source Btus.

612.1.2 The building's actual energy use in equation 6-3 is calculated based on non-renewable source energy used onsite on a square foot basis. Renewable energy above the Section 610 requirement is not included in the calculation.

612.1.2.1 The actual energy use shall be determined by methodologies expressed in Section 603.

612.1.3 The reference energy use is determined by using Table 60X.1 for the building occupancy type and climate zone. The reference is adjusted to account for actual occupied floor area.

612.2 In addition to compliance with energy use requirements, the IgCC requires compliance with greenhouse gas emission requirements. The actual and reference energy use determined in 60X.1 is used to calculate greenhouse gas emissions in relation to the zEPI.

612.2.1 The greenhouse gas emissions for onsite electricity use is determined using the same calculations as in the performance-based pathway (602.2.1)

612.2.2 The greenhouse gas emissions for onsite, non-renewable energy use is determined using the same calculations as in the performance-based pathway (602.2.2)

612.3 Compliance is to be determined post-occupancy

612.3.1 Upon the satisfaction of the code official that all other code requirements are met, a temporary certificate of occupancy is issued.

612.3.2 The energy use and CO₂e calculations determined under this pathway are to be determined and reported to the code official in an acceptable format. The compliant report covers 12 months that meet the target requirements within the 36 month period. The results are to be certified by a registered design professional.

612.3.3 The building is considered compliant and the owner is issued a final certificate of occupancy if they provide an affirmative report as required in section 60X.3.2.

612.3.4 If the building owner is unable to produce the results required within three years of issuance of the temporary certificate of occupancy, the building is in violation of this section of the code.

Cost Impact: Will not increase the cost of construction.

GEW147-14: 601.3-COLKER434

GEW148-14

701.1

Proponent: Dru Meadows, The Green Team, Inc., representing Walmart
(dmeadows@thegreenteaminc.com)

Revise as follows:

701.1 Scope. The provisions of this chapter shall establish the means of conserving water, ~~providing for safe water consumption~~ and protecting the quality of water resources.

Reason: It is not possible to ensure safe water "consumption" since anything may happen to the water after it is supplied.

If the intent is to clarify that nothing in Chapter 7 should result in provision of unsafe water, then the clause should be deleted. Section 102 covers this point. It states that the provisions of the IgCC shall not be deemed to nullify any provisions of law, and that the IgCC is an overlay code to the I-codes. Health and safety are a given. The IgCC is addressing conservation and quality of our water resources.

If there is a different intent, then the clause should be revised appropriately.

Cost Impact: Will not increase the cost of construction.

GEW148-14: 701.1-MEADOWS676

GEW149-14

702.1

Proponent: Karen Hobbs, representing Natural Resources Defense Council
(khobbs@nrdc.org)

Revise as follows:

702.1 Fitting and fixture consumption. Fixtures shall comply with Table 702.1 and the following:

1. For dwelling unit and guestroom shower compartments with a floor area of not greater than 2600 in² (1.7 m²), the combined flow rate from shower water outlets that are capable of operating simultaneously including rain systems, waterfalls, body sprays and jets shall not exceed 2.0 gallons per minute (gpm) (7.6 L/min). Where the floor area of such shower compartments is greater than 2600 in² (1.7 m²), the combined flow rate from simultaneously operating shower water outlets shall not exceed 2.0 gpm (7.6 L/min) for each additional 2600 in² (1.7 m²) of floor area or portion thereof.
2. In gang shower rooms, the combined flow rate from shower water outlets that are capable of operating simultaneously including rain systems, waterfalls, body sprays and jets shall not exceed 2.0 gpm (7.6 L/min) for every 1600 in² (1.01 m²) or portion thereof of room floor area.
3. In shower compartments required to comply with the requirements of Chapter 11 of the *International Building Code*, the combined flow rate from shower water outlets that are capable of operating simultaneously including rain systems, waterfalls, body sprays and jets shall not exceed 4.0 gpm (15.1 L/min) for every 2600 in² (1.7 m²) or portion thereof of room floor area.
4. Showers and tub-shower combinations shall be provided with individual control valves of the pressure balance, thermostatic, or combination pressure balance/thermostatic mixing valve type that provide scald and thermal shock protection for the rated flow rate of the installed showerhead or a flow rate of 1.5 gpm ± 0.1 gpm (5.75 L/m ± 0.35 L/m), whichever is less. Handle position stops shall be provided on such valves and shall be adjusted in accordance with the manufacturer's instructions to deliver a mixed water temperature of not greater than 120°F (49°C). Water heater thermostats shall not be utilized as a substitute for handle position stops.
5. Control valves for showers and tub-shower combinations shall be factory marked with the manufacturer's minimum rated flow and such marking shall be visible at final inspection.

Reason: The thermal protection afforded by shower valves can be compromised if the flow rate of the showerhead is less than the flow rate for which the protective components of the valve have been designed. As noted by Martin and Johnson (2008) (as cited in codes and Standards Enhancement Initiative (CASE), "Multi-Head Showers and Lower-Flow Shower Heads." 2013 California Building Energy Efficiency Standards, California Utilities Statewide Codes and Standards Team. September 2011), combinations of valves and shower heads were tested to determine whether pressure-compensating valves and thermostatic valves rated for 2.5 gpm would perform adequately at lower flow rates. The tests included 22 shower valves from six manufacturers, and the valves were assessed on their ability to maintain water temperature within certain bounds for a given time after a change in pressure event as described by the ASSE 1016-2005 standard for shower valves. The results indicated that a significant share of shower valves rated for 2.5 gpm failed to provide the thermal protection specified by ASSE 1016 when tested at lower flow rates, As summarized in the CASE report (p. 15): "These results indicate that shower valve temperature maintenance is strongly affected by flow rate, and that new showers with lower-flow shower heads would have to be installed with valves that are designed for 2.0 and lower flow rates."

The IgCC requires a maximum flow rate of 2.0 gpm. This code change proposal will help ensure that new buildings built to this code can safely accommodate showerheads with this flow rate. Note that this language does not require that the showerhead itself have a flow rate of 1.5 gpm, but simply that the shower valve provide the thermal protection called for under the recognized standard when tested at a flow rate as low as 1.5 gpm. The marking requirement is necessary to facilitate inspection and compliance. To the extent that the mark is permanent, it will provide a point of reference for building occupants to consider when changing showerheads in future years

Cost Impact: Will not increase the cost of construction.

GEW149-14: 702.1-HOBBS1032

GEW150-14

702.1, Table 702.1, 702.2

Proponent: Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov)

Revise as follows:

702.1 Fitting and fixture consumption. Fixtures shall comply with Table 702.1 and the following:

1. For dwelling unit and guestroom shower compartments with a floor area of not greater than 2600 in² (1.7 m²), the combined flow rate from shower water outlets that are capable of operating simultaneously including rain systems, waterfalls, body sprays and jets shall not exceed 2.0 gallons per minute (gpm) (7.6 L/min). Where the floor area of such shower compartments is greater than 2600 in² (1.7 m²), the combined flow rate from simultaneously operating shower water outlets shall not exceed 2.0 gpm (7.6 L/min) for each additional 2600 in² (1.7 m²) of floor area or portion thereof.
2. In gang shower rooms, the combined flow rate from shower water outlets that are capable of operating simultaneously including rain systems, waterfalls, body sprays and jets shall not exceed 2.0 gpm (7.6 L/min) for every 1600 in² (1.01 m²) or portion thereof of room floor area.
3. In shower compartments required to comply with the requirements of Chapter 11 of the *International Building Code*, the combined flow rate from shower water outlets that are capable of operating simultaneously including rain systems, waterfalls, body sprays and jets shall not exceed 4.0 gpm (15.1 L/min) for every 2600 in² (1.7 m²) or portion thereof of room floor area.

**TABLE 702.1
MAXIMUM FIXTURE AND FITTING FLOW RATES
FOR REDUCED WATER CONSUMPTION**

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE
Showerhead ^a	2.0 <u>1.75</u> gpm and WaterSense labeled
Lavatory faucet and bar sink —private	1.5 <u>1.0</u> gpm
Lavatory faucet—public (metered)	0.25 gpc ^b
Lavatory faucet—public (nonmetered)	0.5 gpm
Kitchen faucet and bar sink —private	2.2 <u>2.0</u> gpm
Kitchen and bar sink faucets in other than dwelling units and guestrooms	2.2 gpm
Urinal	0.5 <u>0.125</u> gpf and WaterSense labeled or nonwater urinal
Water closet—public and remote ^c	1.6 gpf
Water closet—public and nonremote	1.28 gpf average ^{d, e}
Water closet-tank type, private	1.28 gpf and WaterSense labeled ^d

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE
Water closet—flushometer type, private	1.28 gpf ^e
Prerinse spray valves	4-3 <u>1.28 gpm and Watersense labeled</u>
Drinking fountains (manual)	0.7 gpm
Drinking fountains (metered)	0.25 gpc ^b

For SI: 1 foot = 304.8 mm, 1 gallon per cycle (gpc) = 3.8 Lpc, 1 gallon per flush (gpf) = 3.8 Lpf, 1 gallon per minute (gpm) = 3.8 Lpm

- a. Includes hand showers, body sprays, rainfall panels and jets. Showerheads shall be supplied by automatic compensating valves that comply with ASSE 1016 or ASME A112.18.1/CSA B125.1 and that are specifically designed to function at the flow rate of the showerheads being used.
- b. Gallons per cycle of water volume discharged from each activation of a metered faucet.
- c. A remote water closet is a water closet located not less than 30 feet upstream of other drain line connections or fixtures and is located where less than 1.5 drainage fixture units are upstream of the drain line connection.
- d. The effective flush volume for a dual-flush water closet is defined as the composite, average flush volume of two reduced flushes and one full flush.
- e. In public settings, the maximum water use of a dual flush water closet is based solely on its full flush operation; not an average of full and reduced volume flushes.

~~702.2 Combination tub and shower valves.~~ ~~Tub spout leakage from combination tub and shower valves that occurs when the outlet flow is diverted to the shower shall not exceed 0.1 gpm, measured in accordance with the requirements of ASME A112.18.1/CSA B125.1.~~

Reason: When the 2012 IgCC was published, jurisdictions from around the Puget Sound Region banded together to see if we could reduce fixture flow requirements from current code. We started to share Table 702.1 with our builders, owners and industry professionals and the feedback we received is that we could reduce the flow of some fixtures even further, as is demonstrated in the proposal. With further research, we found that there were several product options to choose from at these levels and pricing was quite competitive.

Depending on location, this proposal may minimally increase the cost of construction.

Cost Impact: Will increase the cost of construction.

GEW150-14: 702.1-PETRIE1139

GEW151-14

Table 702.1

Proponent: Shawn Strausbaugh, representing Arlington County, VA (sstrausbaugh@arlingtonva.us)

Revise as follows:

**TABLE 702.1
MAXIMUM FIXTURE AND FITTING FLOW RATES AND QUANTITIES
FOR REDUCED WATER CONSUMPTION^{1,a}**

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE
Showerhead ^a	2.0 gpm at 80 psi and WaterSense labeled
Lavatory faucet and bar sink—private	1.5 gpm at 60 psi
Lavatory faucet—public (metered)	0.25 gpc ^b
Lavatory faucet—public (nonmetered)	0.5 gpm
Kitchen faucet—private	2.2 gpm 1.8 gpm at 60 psi
Kitchen and bar sink faucets in other than dwelling units and guestrooms	2.2 gpm at 60 psi
Urinal	0.5 gpf and WaterSense labeled or nonwater urinal
Water closet—public and remote ^c	1.6 gpf
Water closet—public and nonremote	1.28 gpf average ^{d, e}
Water closet-tank type, private	1.28 gpf and WaterSense labeled ^d
Water closet—flushometer type, private	1.28 gpf ^e
Prerinse spray valves	1.3 gpm and Watersense labeled
Drinking fountains (manual)	0.7 gpm
Drinking fountains (metered)	0.25 gpc ^b

For SI: 1 foot = 304.8 mm, 1 gallon per cycle (gpc) = 3.8 Lpc, 1 gallon per flush (gpf) = 3.8 Lpf, 1 gallon per minute (gpm) = 3.8 Lpm, 1 pound per square inch = 6.895 kPa.

a. Includes hand showers, body sprays, rainfall panels and jets. Showerheads shall be supplied by automatic compensating valves that comply with ASSE 1016 or ASME A112.18.1/CSA B125.1 and that are specifically designed to function at the flow rate of the showerheads being used.

b. Gallons per cycle of water volume discharged from each activation of a metered faucet.

c. A remote water closet is a water closet located not less than 30 feet upstream of other drain line connections or fixtures and is located where less than 1.5 drainage fixture units are upstream of the drain line connection.

d. The effective flush volume for a dual-flush water closet is defined as the composite, average flush volume of two reduced flushes and one full flush.

e. In public settings, the maximum water use of a dual flush water closet is based solely on its full flush operation; not an average of full and reduced volume flushes.

f. Bottle filling stations associated with drinking fountains shall not have limitations for flow rate.

g. Where a faucet has a pot filler mode, the flow shall not exceed 22 gpm at 60 psi. Such faucets shall automatically return to the flow rate indicated in table when the pot filler mode activation mechanism is released or when the faucet flow is turned off.

Reason: New footnote f: Bottle fillers were added to the IPC as an option for use with drinking fountains. If they are used exclusively to fill bottles, limitations on their flowrate will not save water.

New footnote g and label change: Kitchen faucet provisions have been modified in CalGreen and ASHRAE 189.1 to make 1.8 the maximum flowrate, but to allow for a "pot-filler mode" at a higher flowrate. This portion of the change is submitted for consistency.

EPA WaterSense program has finalized a product specification for Pre-Rinse Spray Valves that requires both water savings and basic levels of performance. With

As seen in the revised table pressures have been added under the applicable fixtures flow rate: Flow is a function of pressure, so pressure must be added to properly identify flowrate. This approach aligns it with the IPC, Table 604.4

"Or Quantity" has been added to reflect the fact that some are not flowrates, such as metered faucets, toilets or urinals. This wording matches IPC Table 604.4 nomenclature.

Cost Impact: Will not increase the cost of construction.

GEW151-14: TABLE702.1-STRAUSBAUGH706

GEW152-14

702.4.1 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

702.4.1 Drinking fountain faucets. Drinking fountains shall be equipped with a bubbler for drinking and a separate faucet designed for filling containers that are up to 10 inches in height.

Reason: Drinking fountains should permit people to easily fill their water bottles, in order to encourage people to drink water rather than sugary drinks and to use reusable bottles. This proposal would require water fountains to include a fixture that makes it convenient to fill a bottle.

New York City established a similar regulation in 2012.

Bibliography:

NYC Green Codes Task Force, Health and Toxicity Proposal 20 ([Proposal](#)) NYC Local Law 55 of 2010 ([Law](#); [Legislative Summary](#))

NYC Plumbing Code Section 410 ([Code reference](#))

Cost Impact: Will not increase the cost of construction.

GEW152-14:702.4.1 (NEW)-SCHEIB1131

GEW153-14

702.21 (New)

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

702.21 Emergency Drinking Water Supply. Buildings of Group R or Group I occupancy that have potable water distributions systems that are dependent on the pumping of water supplied from a public water main to any location in the building, shall be designed with emergency potable water supply fixtures. Such fixtures shall be located within the building where the pressure from the public water main will provide for the required flow and pressure in accordance with the *International Plumbing Code*. The fixtures shall be located in an accessible common area of the building. The number and type of emergency potable water supply fixtures chosen shall provide for the filling of portable containers by the building's occupants for obtaining drinking water and water closet flushing water. The number and type of emergency potable water supply fixtures shall be approved.

Exception: Buildings with potable water distribution pumps powered by an emergency or standby power system that is powered by either a renewable or non-renewable energy source, shall not be required to have emergency potable water supply fixtures.

Reason: This proposal would allow people to have better access to drinking water during blackouts. During a power failure, buildings that use electric pumps lose their water supply. Pressure from the public water main may be sufficient to reach the lower stories of the building, but even that may remain unavailable if a non-operating pump blocks the water supply. This proposal would require residential buildings, as well as hotels, dormitories and residential care facilities, to provide drinking water to a common area, supplied directly through pressure in the public water main, for use in a power outage.

Per the 2012 IgCC Preface, the code is "founded on principles intended to establish provisions consistent with the scope of a green construction code that adequately protects public health, safety and welfare".

New York City established a similar regulation in 2013.

Bibliography:

NYC Building Resilience Task Force, Proposal 23 ([Proposal](#))

NYC Local Law 110 of 2013 ([Law](#); [Legislative Summary](#)) NYC Plumbing Code Section 614 and Table 403

Cost Impact: Will not increase the cost of construction.

GEW153-14:702.22 (NEW)-SCHEIB1141

GEW154-14 202, 702.5 (New)

Proponent: John Watson, representing Elkay (john.watson@elkay.com)

Add new text as follows:

702.5 Bottle filling stations. Bottle filling stations shall be integral to, or used as a substitute for, not less than 50 percent of the required number of drinking fountains.

Add new definition as follows:

BOTTLE FILLING STATION. A plumbing fixture connected to the potable water distribution system and sanitary drainage system that is designed and intended for filling personal use drinking water bottles or containers up to 10 inches (254 mm) in height. Such fixtures can be separate from or integral to a drinking fountain and can incorporate a water filter and a cooling system for chilling the drinking water.

Reason: 1. Less water is wasted during the drinking process as virtually no water is lost down the drain unlike traditional drinking fountains which generate up to 50% wastewater into the drainage system. This 50% waste in traditional fountains has been documented in calculations in the outdated ARI 1010 standard (which used 60% for pre-chilling calculations) and confirmed in product testing.

2. Bottle filling stations will reduce the amount of waste generated from plastic bottles that are used to provide drinking water.

Cost Impact: Will not increase the cost of construction.

GEW154-14:702.5 (NEW)-WATSON965

GEW155-14

702.5

Proponent: Jay Peters, Codes and Standards International, representing Falcon Waterfree (peters.jay@me.com)

Delete without substitution:

~~**702.5 Nonwater urinal connection.** The fixture drain for nonwater urinals shall connect to a branch drain that serves one or more lavatories, water closets or water-using urinals that discharge upstream of such urinals.~~

Reason: This provision is in conflict with every current model plumbing code in the country, including the most widely adopted IPC. The experts on the 2015 International Plumbing Code Committee, those charged with the minimum health and safety provisions of the plumbing system, along with industry and ICC members addressed this provision during the recent code cycle and disapproved it based on lack of data to prove it is an issue. (See committee reasoning below P62-12. *underline emphasis added*)

When nonwater urinals are maintained properly per manufacturer installation instructions and the fixture listing requirements, water is periodically flushed through the fixture and into the fixture drain. This serves the purpose of dissolving and removing any potential urine salts in the drainage system.

This provision has potential to have a counter effect on water efficiency efforts. In many cases, It adds additional expense to the initial design and installation of nonwater supplied urinals, deterring efforts to utilize water saving fixtures. Moreover, building owners desiring to be environmentally friendly by conserving thousands, and possibly millions, of gallons of water, by directly replacing existing high volume urinals with new nonwater urinals will oftentimes find it cost prohibitive to re-design and reconfigure a public or commercial bathroom drainage, vent and water supply system located behind the walls of the structure to accommodate this provision.

This provision singles-out nonwater urinals yet does not address issues associated with low flow urinals (1 pint typ.) with minimally diluted urine/water mixtures that tend to trickle through the drainage piping, allowing lime and calcium deposits to accumulate and harden, potentially causing damage to the plumbing drainage system.

Ironically, if this provision remains, the IPC has the potential to save millions more gallons of potable water than the IgCC. Logically, the IgCC should mesh with the IPC by removing this provision and revisiting it when the IPC reconsiders and more data is provided to support claims of drainage issues, which have such a negative effect on water conservation.

As mentioned above, the current section is in conflict with the IPC. The following is the most recent committee action and comment pertaining to the 2015 IPC Proposal.

IPC Technical Committee (2015) reasoning:

P62-12 Committee Action: Disapproved

Committee Reason: The opposition testimony was compelling in stating that there is not any data to support that nonwater urinals are causing widespread problems. To write code language to be mandatory to fix a product that is not performing, is not an acceptable way to solve the problem. If the product does not perform properly then other action should be taken.

Cost Impact: Will not increase the cost of construction. The original provision increases cost of construction whereas removing this provision could potentially reduce costs and make saving a substantial amount of potable water more realistic and less expensive.

GEW155-14: 702.5-PETERS876

GEW156-14

702.6.4 (New), 702.6.5 (New)

Proponent: Julius Ballanco, JB Engineering, Inc., representing InSinkErator (JBENGINEER@aol.com)

Add new text as follows:

702.6.4 Food waste disposer. The water use for a food waste disposer shall not exceed 8 gpm under full load condition and 1 gpm under no-load condition. Food waste disposers shall be equipped with run-cycle time limiting means that requires manual activation for restarting. The maximum allowable run time cycle shall be 10 minutes.

702.6.5 Pulpers and mechanical strainers. The water use for pulpers and mechanical strainers shall not exceed 2 gpm. Pulpers and mechanical strainers shall be equipped with run-cycle time limiting means that requires manual activation for restarting. The maximum allowable run time cycle shall be 10 minutes.

Reason: The addition of these two section will add energy and water conservation requirements for commercial food handling establishment appliances. A standard food waste disposer can be run continuously in a food handling establishment, even though there is nothing discharging down the drain. This is a waste of energy and water. There are green controls available for food waste disposers that result in water and energy savings. This adds a green component to use of a food waste disposer.

Pulpers and mechanical strainers can also waste a tremendous amount of water and energy. Similarly, there are green units available that use a minimal amount of water and shut down after a 10 minute cycle. This adds a green feature to these units.

If a food handling establishment is going to be green they must use energy and water conserving food waste disposers, pulpers, or mechanical strainers.

The section is being renumbered to place the new section between the current sections 702.6.3 and 702.6.4. This would result in this section and table becoming 702.6.6.

Cost Impact: Will increase the cost of construction.

GEW 156-14: 702.6-BALLANCO157

GEW157-14

702.6.1

Proponent: Shawn Strausbaugh, representing Arlington County, VA (sstrausbaugh@arlingtonva.us)

Revise as follows:

702.6.1 Clothes washers. Clothes washers of the type in the ENERGY STAR program as defined in “ENERGY STAR[®] Program Requirements, Product Specification for Clothes Washers, Eligibility Criteria,” shall have a water factor (WF) not exceeding ~~6.0~~ 5.4 and a *modified energy factor* (MEF) of not less than 2.0.

Reason: This change is to coordinate this specific IgCC section with ASHRAE 189.1 -2011. The reduction from a 6.0 water factor to a 5.4 water factor is 10% below the Energy Star requirements.

Cost Impact: Will not increase the cost of construction.

GEW157-14: 702.6.1-STRAUSBAUGH708

GEW158-14

702.7

Proponent: Dru Meadows, The Green Team, Inc., representing Walmart
(dmeadows@thegreenteaminc.com)

Revise as follows:

702.7 709.11 Municipal reclaimed water. Where required by Table 302.1 and where municipal reclaimed water is accessible and allowed for such use by the laws, rules and ordinances applicable in the jurisdiction, it shall be supplied to water closets, water-supplied urinals, water-supplied trap primers and applicable industrial uses. A municipal reclaimed water supply shall be deemed accessible where the supply is not greater than 150 percent of the distance that the potable water supply is from the lot boundary or the supply is within 100 feet (30.5 m) of a potable water supply that serves the lot.

Reason: This proposal relocates Section 702.7 (Municipal reclaimed water) from Section 702 (Fixtures, fittings, equipment and appliances) to Section 709 (Reclaimed water systems). It does not revise any of the language.

This proposal is intended to improve the organization and use of this chapter. Users are not likely to look for reclaim water requirements in Section 702; they will look in Section 709.

Cost Impact: Will not increase the cost of construction.

GEW158-14: 702.7-MEADOWS681

GEW159-14

702.8, 702.8.1, 702.8.2, Table 702.8.2, 702.8.2.1

Proponent: Gary Klein, representing self (gary@aim4sustainability.com)

Delete and substitute as follows:

~~**702.8 Efficient hot and tempered water distribution.** Hot and tempered water distribution shall comply with either the maximum pipe length or maximum pipe volume limits in this section. Hot and tempered water shall be delivered to the outlets of individual showers, combination tub showers, sinks, lavatories, dishwashers, washing machines and hot water hose bibbs in accordance with Section 702.8.1 or Section 702.8.2. For purposes of this section, references to pipe shall include tubing. For purposes of this section, the source of hot or tempered water shall be considered to be a water heater, boiler, circulation loop piping or electrically heat-traced piping.~~

~~**702.8 Efficient heated water supply piping.** Heated water supply piping shall be in accordance with Section 702.8.1 or Section 702.8.2. The flow rate through 1/4 inch piping shall not exceed 0.5 gpm (1.9 Lpm). The flow rate through 5/16 inch piping shall not exceed 1 gpm (3.8 Lpm). The flow rate through 3/8 inch piping shall not exceed 1.5 gpm (5.7 Lpm).~~

Revise as follows:

702.8.1 Maximum allowable pipe length method. For fixtures other than public lavatory faucets, the maximum allowable pipe piping length from the nearest circulation loop pipe or an electrically heat-traced pipe source of hot or tempered water to the termination of the fixture supply pipe shall be in accordance with the maximum pipe length columns in Table 702.8.2. Where the length contains more than one size of pipe, the largest size shall be used for determining the maximum allowable length of the pipe in Table 702.8.2.

702.8.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section 702.8.2.1. For fixtures other than public lavatory faucets, the maximum volume of heated water in the piping from the nearest hot or tempered water in the piping to public lavatory faucets, metering or nonmetering, shall be 2 ounces (0.06 L). For fixtures other than public lavatory faucets, the maximum volume shall be 64 ounces (1.89 L) for hot or tempered water from a water heater or boiler; and 24 ounces (0.7 L) for hot or tempered water from a circulation loop pipe or an electrically heat-traced pipe shall be 24 ounces (0.7 L).

**TABLE 702.8.2
PIPE VOLUME AND MAXIMUM PIPING LENGTH OF PIPE OR TUBE**

NOMINAL PIPE OR TUBE SIZE (inch)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPE OR TUBE PIPING LENGTH (feet)		
		System without a circulation loop or heat-traced line (feet)	System with a circulation loop or heat-traced line (feet)	Lavatory faucets – public (metering and nonmetering) (feet)
1/4 ^a	0.33	50	16	6
5/16 ^a	0.5	50	16	4
3/8 ^a	0.75	50	16	3
1/2	1.5	43	16	2
5/8	2	32	12	1

3/4	3	24	8	0.5
7/8	4	16	6	0.5
1	5	13	5	0.5
1 1/4	8	8	3	0.5
1 1/2	11	6	2	0.5
2 or larger	18	4	1	0.5

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 ml.

- a. The flow rate for 1/4 -inch size pipe or tube is limited to 0.5 gallons per minute; for 5/16-inch size, it is limited to 1 gpm; for 3/8-inch size, it is limited to 1.5 gpm.

702.8.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the circulation loop pipe or an electrically heat-traced pipe source of ~~hot water~~ and the termination of the fixture supply pipe. The volume shall be determined from the liquid ounces per foot column of Table 702.8.2. The volume contained within fixture shutoff valves, flexible water supply connectors to a fixture fitting, or within a fixture fitting shall not be included in the water volume determination. ~~Where hot or tempered water is supplied by a circulation loop pipe or an electrically heat-traced pipe, the~~ The volume shall include the portion of the fitting on the branch source pipe that supplies water to the fixture.

Reason: The reason for this proposal is to correlate the provisions with what was approved for inclusion in the 2015 IECC-CE. CE 274 and CE 275 were approved. The effect of this is to remove two columns from the table, and the associated text from the section.

What remains are the provisions that limit the volume to 24 ounces from a circulation loop pipe or a heat traced pipe to plumbing fixtures or appliances. This will result in reduced hot water delivery times, less wasted water and less wasted energy. We have not done anything to change the volume requirements from water heaters (or boilers) that have been approved for use in the 2015 IECC.

Cost Impact: Will not increase the cost of construction. These provisions were already in the IgCC. The proposal correlates them with the 2015 IECC.

GEW159-14: 702.8-KLEIN959

GEW160-14

702.8.1, 702.8.2, Table 802.8.2, Tables 802.8.2 (2) through 802.8.2 (10) (New), 702.8.2.1

Proponent: Michael Cudahy, representing Plastic Pipe and Fittings Association (mikec@cmservices.com)

Revise as follows:

702.8.1 Maximum allowable pipe length method. The maximum allowable pipe length from the source of hot or tempered water to the termination of the fixture supply pipe shall be in accordance with the maximum pipe length columns in Tables 702.8.2 (2) through 702.8.2 (10), as appropriate for type of the pipe to be installed. Where the type of pipe to be installed is unknown or the type of pipe is not covered by Tables 702.8.2 (2) through 702.8.2 (10), Table 702.8.2 (1) shall be used for design purposes. Where the length contains more than one size of pipe, the largest size shall be used for determining the maximum allowable length of the pipe in the tables 702.8.2.

702.8.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section 702.8.2.1. The maximum volume of hot or tempered water in the piping to public lavatory faucets, metering or nonmetering, shall be 2 ounces (0.06 L). For fixtures other than public lavatory faucets, the maximum volume shall be 64 ounces (1.89 L) for hot or tempered water from a water heater or boiler; and 24 ounces (0.7 L) for hot or tempered water from a circulation loop pipe or an electrically heat-traced pipe. The water volume in the piping shall be calculated in accordance with Section 702.8.2.1.

TABLE 702.8.2 (1)

VOLUME AND MAXIMUM LENGTH OF PIPE OR TUBE OF A TYPE UNKNOWN OR NOT COVERED^b

For SI: 1 inch = 25.4 mm, 1 foot = 304.8mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 ml

- a. The flow rate for 1/4 -inch size pipe or tube is limited to 0.5 gallons per minute; for 5/16 – inch size, it is limited to 1 gpm; for 3/8 –inch size, it is limited to 1.5 gpm.
- b. Not covered means pipe or tube types not covered by Table 702.8.2(2) through 702.8.2(10).

(Portions of table not shown remain unchanged.)

TABLE 702.8.2(2)

VOLUME AND MAXIMUM LENGTH OF TYPE K COPPER TUBING

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Tube Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
3/8 ^a	0.84	44.6	14.3	2.7
1/2	1.45	44.5	16.6	2.1
3/4	2.90	21.7	8.3	0.5
1	5.17	12.6	4.8	0.5
1 1/4	8.09	7.9	3.0	0.5
1 1/2	11.45	5.8	1.9	0.5
2 or larger	20.04	3.6	0.9	0.4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 mL

- a. The flow rate for 3/8 inch size is limited to 1.5 gpm

TABLE 702.8.2(3)
VOLUME AND MAXIMUM LENGTH OF TYPE L COPPER TUBING

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Tube Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Circulation Loop or Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
<u>3/8^a</u>	<u>0.97</u>	<u>38.7</u>	<u>12.4</u>	<u>2.3</u>
<u>1/2</u>	<u>1.55</u>	<u>41.6</u>	<u>15.5</u>	<u>1.9</u>
<u>3/4</u>	<u>3.22</u>	<u>19.6</u>	<u>7.5</u>	<u>0.5</u>
<u>1</u>	<u>5.49</u>	<u>11.8</u>	<u>4.6</u>	<u>0.5</u>
<u>1 1/4</u>	<u>8.38</u>	<u>7.6</u>	<u>2.9</u>	<u>0.5</u>
<u>1 1/2</u>	<u>11.83</u>	<u>5.6</u>	<u>1.9</u>	<u>0.5</u>
<u>2 or larger</u>	<u>20.58</u>	<u>3.5</u>	<u>0.9</u>	<u>0.4</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 mL

a. The flow rate for 3/8 inch size is limited to 1.5 gpm

TABLE 702.8.2(4)
VOLUME AND MAXIMUM LENGTH OF TYPE M COPPER TUBING

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Tube Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Circulation Loop or Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
<u>3/8^a</u>	<u>1.06</u>	<u>35.4</u>	<u>11.3</u>	<u>2.1</u>
<u>1/2</u>	<u>1.69</u>	<u>38.2</u>	<u>14.2</u>	<u>1.8</u>
<u>3/4</u>	<u>3.43</u>	<u>18.4</u>	<u>7.0</u>	<u>0.4</u>
<u>1</u>	<u>5.81</u>	<u>11.2</u>	<u>4.3</u>	<u>0.4</u>
<u>1 1/4</u>	<u>8.70</u>	<u>7.4</u>	<u>2.8</u>	<u>0.5</u>
<u>1 1/2</u>	<u>12.18</u>	<u>5.4</u>	<u>1.8</u>	<u>0.5</u>
<u>2 or larger</u>	<u>21.08</u>	<u>3.4</u>	<u>0.9</u>	<u>0.4</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 mL

a. The flow rate for 3/8 inch size is limited to 1.5 gpm

TABLE 702.8.2(5)
VOLUME AND MAXIMUM LENGTH OF CPVC TUBING, CTS^a

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Tube Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Circulation Loop or Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
<u>1/2</u>	<u>1.25</u>	<u>51.6</u>	<u>19.2</u>	<u>2.4</u>
<u>3/4</u>	<u>2.67</u>	<u>23.6</u>	<u>9.0</u>	<u>0.6</u>
<u>1</u>	<u>4.43</u>	<u>14.7</u>	<u>5.6</u>	<u>0.6</u>
<u>1 1/4</u>	<u>6.61</u>	<u>9.7</u>	<u>3.6</u>	<u>0.6</u>
<u>1 1/2</u>	<u>9.22</u>	<u>7.2</u>	<u>2.4</u>	<u>0.6</u>
<u>2 or larger</u>	<u>15.79</u>	<u>4.6</u>	<u>1.1</u>	<u>0.6</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 ounce = 29.6 mL

a. Copper tube size outside diameter dimension and SDR 11

TABLE 702.8.2(6)
VOLUME AND MAXIMUM LENGTH OF CPVC PIPE, SCHEDULE 40

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Pipe Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Circulation Loop or Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
<u>3/8^a</u>	<u>1.17</u>	<u>32.1</u>	<u>10.3</u>	<u>1.9</u>
<u>1/2</u>	<u>1.89</u>	<u>34.1</u>	<u>12.7</u>	<u>1.6</u>
<u>3/4</u>	<u>3.58</u>	<u>17.6</u>	<u>6.7</u>	<u>0.4</u>
<u>1</u>	<u>5.53</u>	<u>11.8</u>	<u>4.5</u>	<u>0.5</u>
<u>1 1/4</u>	<u>9.66</u>	<u>6.6</u>	<u>2.5</u>	<u>0.4</u>
<u>1 1/2</u>	<u>13.20</u>	<u>5.0</u>	<u>1.7</u>	<u>0.4</u>
<u>2 or larger</u>	<u>21.88</u>	<u>3.3</u>	<u>0.8</u>	<u>0.4</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 mL

a. The flow rate for 3/8 inch size is limited to 1.5 gpm

TABLE 702.8.2(7)
VOLUME AND MAXIMUM LENGTH OF CPVC PIPE, SCHEDULE 80

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Pipe Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Circulation Loop or Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
<u>3/8^a</u>	<u>0.86</u>	<u>43.6</u>	<u>14.0</u>	<u>2.6</u>
<u>1/2</u>	<u>1.46</u>	<u>44.2</u>	<u>16.4</u>	<u>2.1</u>
<u>3/4</u>	<u>2.74</u>	<u>23.0</u>	<u>8.8</u>	<u>0.5</u>
<u>1</u>	<u>4.56</u>	<u>14.3</u>	<u>5.5</u>	<u>0.5</u>
<u>1 1/4</u>	<u>8.24</u>	<u>7.8</u>	<u>2.9</u>	<u>0.5</u>
<u>1 1/2</u>	<u>11.38</u>	<u>5.8</u>	<u>1.9</u>	<u>0.5</u>
<u>2 or larger</u>	<u>19.11</u>	<u>3.8</u>	<u>0.9</u>	<u>0.5</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 mL

a. The flow rate for 3/8 inch size is limited to 1.5 gpm

TABLE 702.8.2(8)
VOLUME AND MAXIMUM LENGTH OF PE-AL-PE TUBING

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Tube Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Circulation Loop or Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
<u>3/8^a</u>	<u>0.63</u>	<u>59.5</u>	<u>19.0</u>	<u>3.6</u>
<u>1/2</u>	<u>1.31</u>	<u>49.2</u>	<u>18.3</u>	<u>2.3</u>
<u>3/4</u>	<u>3.39</u>	<u>18.6</u>	<u>7.1</u>	<u>0.4</u>
<u>1</u>	<u>5.56</u>	<u>11.7</u>	<u>4.5</u>	<u>0.4</u>
<u>1 1/4</u>	<u>8.49</u>	<u>7.5</u>	<u>2.8</u>	<u>0.5</u>
<u>1 1/2</u>	<u>13.88</u>	<u>4.8</u>	<u>1.6</u>	<u>0.4</u>
<u>2 or larger</u>	<u>21.48</u>	<u>3.4</u>	<u>0.8</u>	<u>0.4</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 mL

a. The flow rate for 3/8 inch size is limited to 1.5 gpm

TABLE 702.8.2(9)**VOLUME AND MAXIMUM LENGTH OF PEX AND PE-RT TUBING, CTS^b**

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Tube Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Circulation Loop or Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
<u>3/8^a</u>	<u>0.6</u>	<u>58.6</u>	<u>18.8</u>	<u>3.5</u>
<u>1/2</u>	<u>1.18</u>	<u>54.7</u>	<u>20.3</u>	<u>2.5</u>
<u>3/4</u>	<u>2.35</u>	<u>26.8</u>	<u>10.2</u>	<u>0.6</u>
<u>1</u>	<u>3.91</u>	<u>16.6</u>	<u>6.4</u>	<u>0.6</u>
<u>1 1/4</u>	<u>5.81</u>	<u>11.0</u>	<u>4.1</u>	<u>0.7</u>
<u>1 1/2</u>	<u>8.09</u>	<u>8.2</u>	<u>2.7</u>	<u>0.7</u>
<u>2</u>	<u>13.86</u>	<u>5.2</u>	<u>1.3</u>	<u>0.6</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 mL

a. The flow rate for 3/8 inch size is limited to 1.5 gpm

b. Copper tube size outside diameter dimension and SDR 9, for both PEX and PE-RT types of tubing

TABLE 702.8.2(10)**VOLUME AND MAXIMUM LENGTH OF PEX-AL-PEX TUBING**

<u>Nominal Tube Size (inch)</u>	<u>Liquid Ounces per Foot of Length</u>	<u>Maximum Tube Length</u>		
		<u>System without a Circulation Loop or Heat Traced Line (feet)</u>	<u>System with a Circulation Loop or Heat Traced Line (feet)</u>	<u>Lavatory Faucets - Public (metering and non-metering) (feet)</u>
<u>3/8^a</u>	<u>0.63</u>	<u>59.5</u>	<u>19.0</u>	<u>3.6</u>
<u>1/2</u>	<u>1.31</u>	<u>49.2</u>	<u>18.3</u>	<u>2.3</u>
<u>3/4</u>	<u>3.39</u>	<u>18.6</u>	<u>7.1</u>	<u>0.4</u>
<u>1</u>	<u>5.56</u>	<u>11.7</u>	<u>4.5</u>	<u>0.4</u>
<u>1 1/4</u>	<u>8.49</u>	<u>7.5</u>	<u>2.8</u>	<u>0.5</u>
<u>1 1/2</u>	<u>13.88</u>	<u>4.8</u>	<u>1.6</u>	<u>0.4</u>
<u>2 or larger</u>	<u>21.48</u>	<u>3.4</u>	<u>0.8</u>	<u>0.4</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 mL

a. The flow rate for 3/8 inch size is limited to 1.5 gpm.

702.8.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the source of hot water and the termination of the fixture supply pipe. The volume shall be determined from the liquid ounces per foot column of Tables 702.8.2 (2) through 702.8.2 (10) as appropriate for the type of pipe. Where the type of pipe is unknown or the type of pipe is not covered by Tables 702.8.2 (2) through 702.8.2 (10), Table 702.8.2 (1) shall be used to determine the volume. The volume contained within fixture shutoff valves, flexible water supply connectors to a fixture fitting, or within a fixture fitting shall not be included in the water volume determination. Where hot or tempered water is supplied by a circulation loop pipe or an electrically heat-traced pipe, the volume shall include the portion of the fitting on the source pipe that supplies water to the fixture.

Reason: This proposal improves upon the method of calculating hot water volume in plumbing systems by adding additional tables to the language, as an option, if the piping material of the system is known.

There is a significant difference between tubing materials in regards to volume per unit length as volume of tubing materials for the same application can vary sometimes by as much as 30-40%. This proposal modification is the most accurate as it generates lengths that contain the same volume and will not result in significant differences in buildings when constructed to it.

Also, selecting the proper tables will be necessary if the building is being designed using BIM programs that calculate actual volumes of piping systems, or multiple green building ratings are sought after. One could imagine the challenges that could later occur if a building was designed in a way that did not deliver the hot water as calculated.

Cost Impact: Will not increase the cost of construction.

GEW160-14: 702.8.1-CUDAHY839

GEW161-14

702.10, Chapter 12

Proponent: Jeffrey Waterman, representing Liberty Pumps, Inc.
(jwater@libertypumps.com)

Revise as follows:

702.10 Water-powered sump pumps. Water-powered pumps shall not be used as the primary means of removing ground water from sumps. Where used as an emergency backup pump for the primary pump, the primary pump shall be an electrically powered pump and the water-powered pump shall be equipped with an auditory alarm that indicates when the water-powered pump is operating. The alarm shall have a minimum sound pressure level rating of 85 dB measured at a distance of 10 feet (3048 mm). Where water-powered pumps are used, they shall have a water-efficiency factor of pumping not less than ~~2 gallons (7.6 L)~~ 1.4 gallons (5.3 L) of water to a height of ~~8 feet (2438 mm)~~ 10 feet (3048 mm) for every 1 gallon (3.8 L) of water used to operate the pump, measured at a water pressure of 60 psi (413.7 kPa). Pumps shall be clearly marked as to the gallons (liters) of water pumped per gallon (liters) of potable water consumed. Water-powered sump pumps shall comply with IAPMO PS 119.

Add new standard as follows:

IAPMO Group
4755 E. Philadelphia
Ontario, CA 91761

IAPMO PS 119-2012ae1 Water-Powered Sump Pumps

Reason: Section 702.10 was rewritten during the last IGCC code cycle, and the changes included allowing water-powered sump pumps if the following criteria was followed: the WPP could only be an emergency pump for use when the primary electrically powered pump fails; they must have an alarm to warn of usage; they need to have a water efficiency factor of pumping not less than 2 gallons (7.6 L) of water to a height of 8 feet (2438 mm) for every 1 gallon (3.8 L) of water used to operate the pump, measured at a water pressure of 60 psi (413.7 kPa); and the efficiency factor needs to be marked on the product. The efficiency factor established at that time was just a guess driven primarily from advertising by non-third party listed products.

Shortly after this verbiage was set to be adopted by the IGCC, the topic of water powered pumps was also reviewed by the Plumbing Water Efficiency Task Group for the 2012 code cycle of the IAPMO Green Plumbing and Mechanical Code Supplement (GPMCS), and it was debated whether or not the same criteria should be added to that code. The efficiency ratio adopted by the IgCC was discussed, and there were two issues brought up.

Firstly, the efficiency ratio seemed to be set rather high, and secondly there was no means of insuring whether or not the efficiency factor as marked on the product was truthfullt was suggested that the efficiency ratio could be added to the applicable product standard for these pumps, IAPMO PS 119-2006, "Material and Property Standard for Water Energized Sump Pump." It seemed reasonable since both major plumbing codes -- IAPMO's Uniform Plumbing Code and ICC's International Plumbing Code -- were either written or being revised to make it clear that all plumbing products and materials must be third party listed and must comply with the approved applicable standard (ref. IAPMO 2012 Uniform Plumbing Code, clause 301.1; and ICC 2012

International Plumbing Code, Section 303.4. Several members of the IAPMO GPMCS Water Efficiency Task Group then set out to work with the IAPMO Standards group to set up a separate task group to review and update IAPMO PS 119-2006. The PS 119 task group also included representatives of the three manufacturers of IAPMO/UPC listed water powered sump pumps -- Liberty Pumps, Inc., A.Y. McDonald Mfg. Co., and the Zoeller Pump Company. Representative examples of their products were exchanged between the three companies so they could compare results from their respective WPP test cells for the purpose of determining the best construction of a laboratory test cell and establishment of a testing procedure, and the determination of an appropriate minimum efficiency ratio. A test cell design and procedure was approved, and efficiency ratios were reviewed. It appeared that the IGCC 2:1 @ 8 feet ratio was beyond the current state of the art of WPP design. While a product could be designed to meet this specific set of parameters, the real world usage of these pumps requires them to be effective under a multitude of inlet pressures and discharge heads. Also it also was felt that an efficiency ratio at 10 feet as opposed to 8 feet would be more meaningful since it probably was closer to the average elevation from the bottom of a sump pit to its discharge point. The result of the task group was creation of the revised product standard IAPMO PS 119-2012a(e1), "Water Powered Sump Pumps".

This revised standard established the performance requirement as follows: "The pump efficiency ratio at 415 ± 1.4 kPa (60 ± 0.2 psi) and at a head of 3.0 ± 0.06 m (10 ± 0.2 ft), calculated in accordance with Section 5.3.2(h), shall be at least 1.4." Subsequent to the revision of IAPMO PS 119, the 2012 IAPMO Green Plumbing and Mechanical Code

Supplement adopted this efficiency ratio. The IAPMO 2012 GPMCS clause reads as follows:

412.0 Water-Powered Sump Pumps. Sump pumps powered by potable or reclaimed (recycled) water pressure shall only be used as an emergency backup pump. The water-powered pump shall be equipped with a battery powered alarm having a minimum rating of 85 dBA at 10 feet (3048 mm). Water-powered pumps shall have a water efficiency factor of pumping at least 1.4 gallons (5.3 L) of water to a height of 10 feet (3048 mm) for every gallon of water used to operate the pump, measured at a water pressure of 60 psi (414 kPa). Pumps shall be clearly labeled as to the gallons of water pumped per gallon of potable water consumed. Water- powered stormwater sump pumps shall be equipped with a reduced pressure principle backflow prevention assembly.

The proposed change to IgCC Section 702.10 will harmonize the green construction codes, permit usage of water powered pumps with efficiency factors at the current state of the art in performance, and with the acceptance of IAPMO PS 119-2012a(e1) into IGCC Chapter 12 ("Referenced Standards") there is a means for third party certification which includes a validation of the required efficiency factor labeling

Bibliography:

2012 Green Plumbing & Mechanical Code Supplement, Clause 412.0, pub. The International Association of Plumbing and Mechanical Officials, 2012, Page 14

Cost Impact: Will not increase the cost of construction. No impact.

Analysis: A review of the standard proposed for inclusion in the code, IAPMO PS 119-2012ae1 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

GEW161-14: 702.10-WATERMAN1020

GEW162-14

702.18, 702.18.1

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee
(AHC@iccsafe.org)

Delete without substitution:

~~**702.18 Autoclaves and sterilizers.** Autoclaves and sterilizers requiring condensate tempering systems shall be of the type that does not require potable water to be blended with the discharge water to reduce the temperature of discharge.~~

~~**702.18.1 Vacuum autoclaves and sterilizers.** Vacuum sterilizers shall be prohibited from utilizing venturi-type vacuum mechanisms using water.~~

Reason: There are problems with the code text requirements and the types of sterilizers currently on the market. In Section 702.18.1, there is only one manufacturer that provides this type of device.
For Section 702.18

Options with Pros and Cons

Chilled Water Recirculation Loop for Medium & Large Size Sterilizers – Reduces total water consumption per sterilization cycle to 1-1.5 gallons.

Pros:

- Sterilizers are tied into the facility's chilled water recirculation loop when systems have excess capacity to supply and cool steam sterilizer units. This recirculation loop prevents the majority of the water used in the steam sterilizers to be flushed down the facility drain
- Only 1-1.5 gallons of water are consumed per cycle

Cons

- Added product acquisition costs (\$ 5,000 to \$ 10,000) per sterilizer + any associated installation costs to connect to the facility chilled water system
- Added cost for hospital to install Chilled Water Loop piping infrastructure to the SPD department. Might require larger chiller system to feed multiple steam sterilizers in SPD. (additional cost)
- Some competitors require additional sq/ft to install chilled water recirculation system (lost space to the facility)
- This option may not be viable to facilities that are replacing old sterilizers with new ones. (infrastructure, footprint, cost, etc.)
- Currently not available on small sterilizers (3-5 year development project). Vendor cost would increase
- Many hospitals do not have excess chilled water capacity for the SPD
- Chilled water supply all year round, for all seasons in the northern US might not be feasible.
- Some facilities don't rely on a central steam boiler system for the steam sterilizers. These Customers use electric steam generators to supply their steam sterilizers. Stand alone or integral steam generators must have potable water for steam generation, discharge of sterilizer, and discharge of generator. There is no manufacturing chilled water solution for stand alone or integral steam generators. No current solution

Non Potable Water Options (Grey Water or Rain Water)

Pros

- Utilize untreated water and save potable water consumption

Cons

- Today, manufactures have designed steam sterilizers to accept only one feed water source, potable water. To change this design to accept grey water & potable water for the steam sterilizer, there would be an increase the total acquisition cost of the sterilizer unit.
- Steam sterilizers have specific water quality requirements to ensure proper performance. There are no current water quality standards established for the use of grey water in steam sterilizer systems. Facilities will still need to meet manufacturing water quality requirements even with grey water. Obviously there is more variability and unknown elements in grey water that exponentially increase water quality variability. New project development required (3-5 years) by manufacturers. Added cost of equipment (\$ 1,000 - \$ 2,000) per unit depending sterilizer model.

- Grey Water must be collected and treated by hospital. Cost to the facility to implement Non-Potable Water could be significant. (reclamation, collection, treatment, filtration, and delivery to the SPD)
- Hospital infection control concerns with Non-Potable Water in clean (sterile processing) environments, creation of aerosols, potential bacteria introduced from these systems, cross contamination, backflow issues, etc. are all concerns.

Alternate Non-Potable Water Reclamation/Recirculation Systems

Pros

- Utilize water loops for discharge to recirculate and only add fresh water when needed. System could be consolidated for several units (mini water treatment system in each facility) or stand alone for each sterilizer.

Cons

- Effectively requires a mini water treatment unit inside each facility. Additional cost and maintenance would be the responsibility of the facility. (water must be decontaminated & treated)
- Nothing commercially available at this time from any of the major sterilization equipment manufacturer.
- Multiple systems would be required for multiple sized units or entire departments, adds significant cost and requires additional space for processing water recirculation by hospital.
- Hospital infection control concerns with Non-Potable Water in clean (sterile processing) environments, creation of aerosols, potential bacteria introduced from these systems, cross contamination, backflow issues, etc. are all concerns.

Steam Condensate Return Lines

Pros

- Steam condensate is returned to the boiler, which is the largest reason for water consumption in a sterilizer cycle. Water consumption significantly reduced.
- Know technology, but not available for steam sterilizers

Cons

- Additional cost for return piping infrastructure by hospital
- Hospital infection control concerns to return steam that was used for sterilization purposes into the main hospital steam boiler system
- Potable water still needed for 50% of the units sold with a built in steam generator
- No current commercialized solution available on the market for steam sterilizers

SUMMARY

All of these options will require additional equipment, cost, square footage, and infrastructure changes by the facility. Many of these options may not be available in facilities such as small hospitals, surgery centers, or converted/renovated hospital space. Additional product development, FDA Submission, or additional equipment from manufacturers could take 3-5 years to comply with these codes.

For Section 702.18.1:

Select small & medium sized steam sterilizers currently use Venturi-type vacuum mechanisms. Venturi systems do have a positive role for certain applications. Small steam sterilizers are infrequently used near the OR. These small sterilizers have low usage and lower water consumption vs. larger units. Venturi systems cost much less than vacuum pump systems. If vacuum pumps are the only solution, small steam sterilizer costs will increase. The footprint of the sterilizer might also increase, making it difficult to replace older units that were smaller in design.

We agree that medium to large steam sterilizers should only use vacuum pump systems due to their larger water volume demand per cycle.

Pros

- Vacuum Pump Systems (vs. Venturi systems) could reduce water consumption by 40-50%

Cons

- Vacuum systems are not available currently for the small sterilizers from largest market share manufacturer in US at this time. To our knowledge, only one manufacturer uses vacuum pumps in small sterilizers which would create a monopoly with new code language
- Hospitals would be required to run additional electric (208 or 480 service) to ALL locations requiring small sterilizers. Currently only 50% of the small sterilizers sold require the installation of the high voltage, 3 phases lines. Additional costs would be incurred to provide electrical lines or force hospital to purchase larger sterilizers with built in vacuum pump.
- Vacuum pumps use additional electric consumption as a trade off for the water saving.

- Vacuum pumps still require water for the seal. Facilities would still have to incur the costs of providing water lines to the units.

Pump noise levels may not be acceptable in clinical spaces adjacent to operating rooms

Small sterilizers with electric steam generators, water recirculation, and vacuum pumps may expand the footprint of the sterilizers beyond what is acceptable in small areas provided in the OR space, requiring additional sq/ft costs by the facility

Not commercially available (3-5 year development process)

Added cost could be 10-15% above current costs (Average unit costs \$35-45k for surgery applications today)

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Chilled Water Recirculation Loop for Medium & Large Size Sterilizers – Reduces total water consumption per sterilization cycle to 1-1.5 gallons.

Cost Impact: Will not increase the cost of construction.

GEW162-14: 702.18-PAARLBERG656

GEW163-14

703.3

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Delete and substitute as follows:

~~**703.3 Condensate coolers and tempering.** Potable water shall not be used as tempering water for sanitary discharge where the tempering water volume requirement for the application exceeds 200 gallons per day (757 liters per day). Where the tempering water volume required for the application is 200 gallons per day (757 liters per day) or less and potable water is used for tempering, water flow control devices shall be installed. Such control devices shall limit the flow rate of tempering water to that which is necessary to limit the temperature of the waste discharge to a maximum of 140°F (60°C). Such devices shall have a maximum flow rate of 200 gallons per day (757 liters per day).~~

703.3 Potable and nonpotable water prohibited for tempering. Neither potable water nor nonpotable water shall be used for tempering condensate and other waste water before discharging it to the sanitary drainage system.

Reason: Tempering water is used to cool condensate (for instance, from a steam heat system), which is then drained into the sewer. The current limit of 200 gallons per day would still allow 73,000 gallons per year of water to be delivered to the sanitary sewer, after serving no other use that briefly absorbing some heat. Even nonpotable water that has been treated sufficiently to permit its use inside buildings can be used for a higher purpose than as a heat sink. No other building systems waste water in this manner, and the green code should prohibit new installations from using tempering water (either potable or nonpotable) for condensate.

Bibliography:

NYC Green Codes Task Force, Proposal Water Efficiency 6 ([Proposal](#)) NYC Local Law 54 of 2010 ([Law](#); [Legislative Summary](#))
NYC Plumbing Code Section 202 and 428 ([Code reference](#))

Cost Impact: Will not increase the cost of construction.

GEW163-14: 703.3-SCHEIB1159

GEW164-14

703.7.3, 703.8

Proponent: Dru Meadows, The Green Team, Inc., representing Walmart
(dmeadows@thegreenteaminc.com)

Delete without substitution:

~~**703.7.3 Metering.** The metering of mechanical systems, system components, equipment and appliances shall be conducted in accordance with Section 705.1.~~

Revise as follows:

703.8 Wet-hood exhaust scrubber systems. Where wet-hood exhaust scrubber systems are used, they shall incorporate a water recirculation system. ~~The makeup water supplies for such systems shall be metered in accordance with Section 705.1.~~

Reason: Metering requirements are in Section 705 (Metering). The language in 703.7.3 and 703.8 does not add any further requirements. There are no similar cross references for other systems or equipment (e.g. irrigation or nonpotable systems). Removing the cross references will simplify the code language without diminishing the requirements or application.

Cost Impact: Will not increase the cost of construction.

GEW164-14: 703.7.3-MEADOWS683

GEW165-14

705.1

Proponent: Anthony Apfelbeck, City of Altamonte Springs, FL, representing City of Altamonte Springs (ACApfelbeck@altamonte.org)

Revise as follows:

705.1 Metering. Water consumed from any source associated with the building or building site shall be metered. Each potable and reclaimed source of water, and each onsite nonpotable water source, shall be metered separately. Meters shall be installed in accordance with the requirements of the *International Plumbing Code*. For the purposes of Section 705.1.1, each meter identified in Table 705.1.1 shall be capable of communicating water consumption data remotely and at a minimum, be capable of providing daily data with electronic data storage and reporting capability that can produce reports that show daily, monthly, and annual water consumption.

Exception: Fire sprinkler systems installed in accordance with Section 903.3 of the International Fire Code shall not be required to be metered.

Reason: The metering of fire sprinkler systems is an unnecessary cost as these systems only flow water in an emergency. Water is not "consumed" by the fire sprinkler system as a normal course of operations and, therefore, a straight reading of 705.1 would not require metering under the core code provision. In fact, metering of these systems can significantly impact the water supply available for the sprinkler system and create further cost impacts as a result of the need to increase pipe sizes due to the unnecessary meter loss. This language clarifies that there is no need to meter these systems.

Cost Impact: Will not increase the cost of construction.

GEW 165-14: 705.1-APFELBECK262

GEW166-14

705.1, 705.1.1, Table 705.1.1

Proponent: Dru Meadows, TheGreen Team, Inc., representing Walmart (dmeadows@thegreenteaminc.com)

Revise as follows:

705.1 701.2 Metering Water usage metering required. Water consumed from any source associated with the building or building site shall be metered. Each potable and reclaimed source of water, and each onsite nonpotable water source, shall be metered separately. Meters shall be installed in accordance with the requirements of the *International Plumbing Code*. For the purposes of Section ~~705.1.4~~701.2.1, each meter identified in Table ~~705.1.4~~ 701.2.1 shall be capable of communicating water consumption data remotely and at a minimum, be capable of providing daily data with electronic data storage and reporting capability that can produce reports that show daily, monthly, and annual water consumption.

705.1 701.2.1 Metering Individual metering required. All potable and nonpotable water supplied to the applications listed in Table ~~705.1.4~~701.2.1 shall be individually metered in accordance with the requirements indicated in Table ~~705.1.4~~701.2.1. Similar appliances and equipment shall be permitted to be grouped and supplied from piping connected to a single meter.

TABLE ~~705.1.4~~ 701.2.1 METERING REQUIREMENTS

(portions of table not shown remain unchanged)

Reason: This proposal only relocates metering requirements (Section 705) to the general requirements (Section 701). It doesn't delete or change any language.

This proposal is intended to improve the overall logic and consistency of the chapter. The metering requirements are general requirements applicable to all buildings. Similar general requirements in other chapters are located in the first sections of those chapters (e.g. the site inventory requirements in Chapter 4 and the IAQ management plan requirements in Chapter 8). Other sections are applicable only to the extent that such systems or equipment is incorporated into the building. You are not required to have rainwater collection systems - but, if you do, you need to comply with the rainwater requirements. You must comply with the metering requirements.

Cost Impact: Will not increase the cost of construction.

GEW166-14: 705.1-MEADOWS675

GEW167-14

706.1, Chapter 12

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

706.1 Scope. The provisions of this section shall govern the use of nonpotable water and the construction, installation, and design of systems utilizing nonpotable water. The use and application of nonpotable water shall comply with laws, rules and ordinances applicable in the jurisdiction. Where the jurisdiction does not have an applicable ordinance for the use and application of nonpotable water, the use and application of nonpotable water shall comply with CSA B128.3.

Add a new standard as follows:

CSA

B128.3-12 Performance of non-potable water reuse systems

Reason: The addition of the alternative option to follow CSA B128.3 "Performance of non-potable water reuse systems" gives criteria for jurisdictions that do not have their own ordinances currently in place while still allowing the jurisdiction to have priority over the standard if they already have a policy in place.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, CSA B128.2-12, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW167-14: 706.1-REIHELD1067

GEW168-14

706.3, Chapter 12

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

706.3 Water quality. Nonpotable water for each end use application shall meet the minimum water quality requirements as established for the application by the laws, rules and ordinances applicable in the jurisdiction. Where the jurisdiction does not have an applicable ordinance for nonpotable water quality, the water shall meet the minimum water quality requirements of CSA B128.3.

Add new standard as follows:

CSA

B128.3-12 Performance of non-potable water reuse systems

Reason: The addition of the alternative option to follow CSA B128.3 "Performance of non-potable water reuse systems" gives criteria for jurisdictions that do not have their own ordinances currently in place.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, CSA B128.3-12, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW168-14: 706.3-REIHELD1057

GEW169-14

707.1, Chapter 12

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

707.1 Scope. The provisions of this section or the provisions of CSA B128.1/CSA B128.2 shall govern the construction, installation, alteration, and repair of rainwater collection and conveyance systems.

Add new standard as follows:

CSA

CSA B128.1-06/CSA B128.2-06 Design and Installation of Non-Potable Water Systems/Maintenance and Field Testing of Non-Potable Water Systems

Reason: The addition of the option to follow CSA B128.1/CSA B128.2 "Design and installation of non-potable water systems/Maintenance and field testing of non-potable water systems" gives an alternative reference standard that is equivalent to the IGC provisions included in this section.

Cost Impact: Will not increase the cost of construction

Analysis: A review of the standards proposed for inclusion in the code, CSA B128.1-06/CSA B128.2-06, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW169-14: 707.1-REIHELD1059

GEW170-14

708.12

Proponent: Dru Meadows, The Green Team, Inc., representing Walmart
(dmeadows@thegreenteaminc.com)

Revise as follows:

708.12 ~~Gray~~ Specific gray water system design. The design of the gray water system shall conform to ~~accepted engineering practice~~ the requirements of Section 708.

Reason: The term "accepted engineering practice" is subjective and difficult to enforce.

Cost Impact: Will not increase the cost of construction.

GEW 170-14: 708.12-MEADOWS241

GEW171-14

709.6

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

709.6 Approved components and materials. Piping, plumbing components, and material used in the reclaimed water systems shall be manufactured of material *approved* for the intended application as specified in the *International Plumbing Code*.

Reason: Adding reference to components and materials as those specified in IPC makes this section consistent with other sections referring to IPC requirements.

Cost Impact: Will not increase the cost of construction.

GEW171-14: 709.6-REIHELD1186

GEW172-14

709.9

Proponent: Dru Meadows, The Green Team, Inc., representing Walmart
(dmeadows@thegreenteaminc.com)

Revise as follows:

709.9 Reclaimed water systems. The design of the reclaimed water systems shall conform to ASTM E 2635 and ~~accepted engineering practice~~ the requirements of Section 709.

Reason: The term "accepted engineering practice" is subjective and difficult to enforce.

Cost Impact: Will not increase the cost of construction.

GEW172-14: 709.9-MEADOWS680

GEW173-14

703.7.6, 703.7.6.1 (New)

Proponent: Daryn Cline, EVAPCO, Inc., representing EVAPCO (dcline@evapco.com)

Delete and substitute as follows:

~~**703.7.6 Water** Where nonpotable water is used within cooling towers, evaporative condensers and fluid coolers, it shall conform to the water quality and treatment requirements of the jurisdiction having authority and the water chemistry guidelines recommended by the equipment manufacturers.~~

703.7.6 Potable and nonpotable make-up water quality. Where potable and nonpotable make-up water is used within cooling towers, evaporative condensers and fluid coolers, such water shall conform to the water quality and treatment requirements of a water treatment plan developed in accordance with Section 703.7.6.1.

Add new text as follows:

703.7.6.1 Water Treatment Plan. The water treatment plan shall be based on the water chemistry guidelines recommended by the equipment manufacturers, the authority having jurisdiction and a make-up water analysis of the following parameters:

1. Conductivity in μ S/ml
2. pH
3. Total Hardness in ppm as CaCO₃
4. Ca Hardness in ppm as CaCO₃
5. Mg Hardness in ppm as CaCO₃
6. Alkalinity in ppm as CaCO₃
7. Silica in ppm
8. Chlorides in ppm
9. Sulfate in ppm
10. Iron in ppm

The plan shall:

1. the control of microbiological activity, scale and corrosion.
2. specify the equipment and products used for treating the water of an open recirculating loop.
3. maximize cycles of concentration as required by Section 703.7.7.
4. address equipment and product compatibility with equipment materials of construction and system metallurgy.
5. include a schedule for the required inspection, maintenance and monitoring of the system and shall include a corrective actions log.
6. include owner's training and commissioning documents.
7. identify the persons responsible for providing and maintaining the system water treatment.

Reason: This section is revised and expanded to include a complete water analysis requirement, not just for non-potable, but for potable water used as make up for cooling towers, evaporative condensers and fluid coolers. This complete water analysis is required and to be used to determine the maximum allowable parameters for the recirculating water loop previously submitted by EVAPCO to accurately determine cycles of concentration levels as defined in Section 703.7.7 Discharge based on water chemistry.

This expanded code section also recommends adding the requirement of a documented water treatment plan, based on the make-up water chemistry (potable or non-potable) documented in Section 703.7.6. and 1. A water treatment plan that considers the HVAC system, water temperature and component metallurgy is utilized to further extend the life of the cooling system and to

provide an efficient heat transfer system with minimal biological fouling and scaling, providing an energy saving design for the life of the system.

Cost Impact: Will not increase the cost of construction.

GEW173-14: 703.7.6 #2-CLINE1056

GEW174-14
703.7.7, Table 703.7.7

Proponent: Daryn Cline, EVAPCO Inc, representing EVAPCO (dcline@evapco.com)

Revise as follows:

~~**703.7.7 Discharge.** The discharge water from cooling towers used for air conditioning systems shall be in compliance with Table 703.7.7. Where the discharge water is not captured for reuse, it shall be discharged and treated in accordance with jurisdictional requirements, if applicable.~~

~~**Exception:** Discharge water with total dissolved solids in excess of 1,500 ppm (1,500 mg/L), or silica in excess of 120 ppm (120 mg/L) measured as silicon dioxide shall not be required to meet the minimum parameters specified in Table 703.7.7.~~

703.7.7 Discharge water. The parameters of the discharge water from cooling towers used for air conditioning systems shall not exceed the values indicated in Table 703.7.7. The maximum cycles of concentration for a cooling tower shall be where any one of the following conditions occur:

1. Any value indicated in Table 703.7.7 is achieved.
2. Ten cycles of concentration have occurred.
3. The operation of the condenser water system is affected.

Cooling tower discharge water that is not captured for reuse shall be discharged and treated in accordance with the requirements of the jurisdiction, where applicable.

TABLE 703.7.7
MINIMUM CYCLES OF CONCENTRATION DISCHARGE WATER
MAXIMUM PARAMETER VALUES FOR WATER IN COOLING TOWER CONDENSER
LOOP^a

MAKEUP WATER TOTAL HARDNESS (mg/L)^a PARAMETER	MINIMUM CYCLES OF CONCENTRATION MAXIMUM VALUE
<200 <u>Langelier Stability Index</u>	5 <u>2.8</u>
≥200 <u>Ca (as CaO3)</u>	3.5 <u>800 ppm</u>
<u>Total (M) Alkalinity</u>	<u>500 ppm</u>
<u>SiO2</u>	<u>150 ppm</u>
<u>Cl</u>	<u>300 ppm</u>
<u>Sulfates</u>	<u>250 ppm</u>
<u>Conductivity</u>	<u>4000µS/ml</u>

a. Total hardness concentration expressed as calcium carbonate. Values based upon a galvanized steel cooling tower operating at a maximum temperature of 110°F (43.3°C).

Reason: The requirements in the current code are a function of the hardness expressed as calcium carbonate in the makeup water itself, which varies by location, source and time of the year. Please note that a complete water analysis would allow more precision in the selection of the appropriate cycles of concentration.

A suggested analysis based on the new Table 703.7.7 with maximum water chemistry limits is recommended for the next version of the code. These new suggested guidelines in the suggested Table 703.7.7 begin with a LSI (Langelier Stability Index) requirement. The maximum LSI of 2.8 is called out to avoid potential deposition problems, but there is also a limit on the system temperature and cooling tower materials of construction at 110°F and galvanized steel respectively.

A general requirement for cycles as proposed in the current Table 703.7.7 without specifying a particular make-up water quality could lead to unforeseen water quality issues. The limits in Table 703.7.7, will cover many installations, but not all. There are other minerals and combinations of minerals that will prevent a particular make-up water from being cycled as high as the current version requires.

Cost Impact: Will not increase the cost of construction.

GEW174-14: 703.7.7-CLINE1018

GEW175-14

703.9.1.1 (New)

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org); Brenda Thompson representing ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Add new text as follows:

703.9.1.1 Group I-2, Condition 2, occupancies overflow alarm supervision. Group I-2, Condition 2, occupancies shall have overflow alarms connected to a direct digital control system or other approved supervisory and monitoring system.

Reason: Overflow alarms are a very wise idea, and hospitals can accommodate this requirement. However, this chapter is written considering a local audible alarm. This proposal seeks to include such an alarm in a hospital's direct digital control system, which exists in the hospital to monitor other considerations such as airflow, fire alarms, and other required aspects of the patient care environment which they are required to monitor. These systems are monitored by hospital staff 24/7/365, either by on-site staff or remote alters (pager, text) which can mobilize personnel quickly in the event of an active alarm. A local audible alarm would likely go unheard if in the mechanical rooms, especially on second or third shift when staff is more minimal, and rounding the areas do not occur as frequently. Including in the direct digital control system would ensure the alarm receives more prompt attention.

This proposal is cosponsored by the ICC Ad Hoc Committee for Healthcare (AHC) and the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC).

The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>.

The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW175-14: 703.9.1.1(NEW)-PAARLBERG657

GEW176-14

703.10 (New)

Proponent: Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org)

Add new text as follows:

703.10 HVAC system water usage for performance-based compliance. This section shall apply only where a performance-based compliance path for the building and its site is used. Water usage of HVAC systems in the *proposed design* shall be equal to or less than the water usage of HVAC systems in the *standard reference design*.

Exception: Water usage of HVAC systems in the *proposed design* shall not be required to be equal or less than in the *standard reference design* provided that the site energy usage of HVAC systems in the *proposed design* is at least 20 percent less than the site energy usage of the HVAC system in the *standard reference design*.

Reason: This edit will ensure that proposed HVAC systems are as efficient in their use of water as in the standard reference design HVAC system. This edit also allows flexibility, as there will be options that will increase HVAC energy efficiency but also increase the amount of water that is being used at the building site. In many cases, systems that are more efficient in their use of water will also be more efficient in their use of energy.

Example: A two-stage gas-fired absorption 500 ton chiller will use about 6-7 gallons/ton-hour of make-up water in the cooling tower system, and have a rated full load efficiency of 1.0 COP. A 500 ton electric chiller rated at 0.56 kW/ton at full load will use about 3.5-4 gallons/ton-hour of make-up water in the cooling tower system (33- 50% reduction in water use) and have a full load efficiency of 6.28 COP. The more water efficient system will use much less energy.

Cost Impact: Will not increase the cost of construction.

GEW176-14: 703.10 (NEW)-ROSENSTOCK511

GEW177-14

704.1.2

Proponent: Ed Osann, representing Natural Resources defense Council
(eosann@nrdc.org)

Revise as follows:

704.1.2 Water consumption. Water softeners shall have a maximum water consumption during regeneration of ~~5~~ 4 gallons (~~18.9~~ 15.1 L) per 1000 grains (17.1 g/L) of hardness removed as measured in accordance with NSF 44.

Reason: The current specification for water consumption is the minimum voluntary performance specification contained in NSF 44, which more than 60% of residential demand-initiated regeneration (DIR) models meet. Furthermore, at least half the residential DIR systems on the market use 4.0 gallons of water or less per 1000 grains of hardness removed. Thus, the IgCC has ample room to specify a water consumption specification that is substantially more resource-efficient than the minimum in NSF 44.

Bibliography:

Notification of Intent to Develop Draft Efficiency and Performance Specifications for Cation Exchange Water Softeners, US Environmental protection Agency, November 18, 2010.

Cost Impact: Will not increase the cost of construction. Many models are on the market today that would meet the specification proposed here for 2015. Cost impact is negligible.

GEW177-14: 704.1.2-OSANN1158

GEW178-14

705.1.1

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee (AHC@iccsafe.org)

Revise as follows:

705.1.1 Metering. All potable and nonpotable water supplied to the applications listed in Table 705.1.1 shall be individually metered in accordance with the requirements indicated in Table 705.1.1. Similar appliances and equipment shall be permitted to be grouped and supplied from piping connected to a single meter.

Exception: In Group I-2, Condition 2 occupancies and ambulatory care facilities, water used for patient treatment or to support patient care shall not be required to be individually metered.

Reason: Water systems are directly tied to the environment of care. The complexity of healthcare systems is such that individual metering of the listed systems is impractical. Although there is a focus to replace equipment with more efficient components and controls, existing healthcare facilities have older systems that would be impractical to install meters on the individual components. The cost to install separate meters will have minimal effect on the required environmental aspects, especially regarding temperature and humidity, which are required by ASHRAE 170 and drive the majority of the hospital's water consumption. Other systems, such as water features and therapy pools that are used for patient treatment, make only a small fraction of the overall water consumption. For this reason, the metering that leads to water savings solutions is minimized making the metering impractical.

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction. This change has significant first-cost impact, with minimal life cycle costs benefits.

GEW178-14: 705.1.1-PAARLBERG658

GEW179-14

Table 705.1.1

Proponent: Daryn Cline, representing EVAPCO, Incorporated (dcline@evapco.com)

Revise as follows:

**TABLE 705.1.1
METERING REQUIREMENTS**

APPLICATION	REQUIREMENTS
<u>Open & Closed Circuit Cooling towers</u>	Cooling towers of 100 tons capacity or greater or groups of towers with a flow through tower greater than 500 gpm (30 L/s) shall be required to utilize a meter on makeup water and blow-down water supply lines.

(Portions of table not shown remain unchanged.)

Reason: Reason for editing the Cooling Tower section:

- 1) Clarify that this applies to open and closed circuit cooling towers (not just open towers)
- 2) This suggested edit of switching "to greater than 500 gpm, in lieu of 100 tons or greater" matches ASHRAE 189.1, and eliminates the tonnage requirements.
- 3) Removes "Groups of towers" wording which seemed vague and out of place.

Bibliography:

ASHRAE Standard 189.1-2011 Standard for the Design of High-Performance Green Buildings Page 21, Table 6.3.3B Subsystem Water Measurement Thresholds.

Cost Impact: Will not increase the cost of construction. This proposed change will result in a cost savings to the owner, as metering will not be required for small 100 ton cooling towers.

GEW179-14: TABLE 705.1.1-CLINE917

GEW180-14

Table 705.1.1

Proponent: Ed Osann, representing Natural Resources Defense Council
(eosann@nrdc.org)

Revise as follows:

**TABLE 705.1.1
METERING REQUIREMENTS**

APPLICATION	REQUIREMENTS
Irrigation	In-ground irrigation systems for outdoor landscaping <u>Irrigation systems that are automatically controlled</u> shall be metered.
Non-residential <u>tenant</u> Tenant spaces	Tenant <u>Non-residential tenant spaces such as for medical offices, dental offices, dine-in restaurants, cafeterias, laundries and any other occupancy that is estimated to consume over 1000 gallons of water per day shall be metered individually.</u>
<u>Residential tenant spaces</u>	<u>Residential tenant spaces shall be metered individually.</u>

(Portions of table not shown remain unchanged.)

Reason: This proposal establishes separate metering requirements for residential and non-residential tenant space. Specified occupancies that are characterized by significant levels of water consumption are listed and required to be separately metered, together with any other occupancies that are estimated to use over 1,000 gallons per day as in the present language. This approach removes the need for an estimate of future water use for the most common high-water-use occupancies.

This proposal also requires the installation of water sub-meters for individual units in newly constructed apartment buildings. Public water suppliers typically do not install meters of their own on water supply piping to individual units, and occupants typically pay for water and sewer service as part of their rent or condominium fee. Sub-metering in new multi-family buildings, when used for allocating the cost of water and wastewater service to individual dwelling units, ensures that water users receive an appropriate signal regarding the volume and cost of their water use, and thus incentivizes residents to undertake responsible water use and prompt reporting of fixtures in need of repair.

Sub-metering is also useful in identifying leakage or unintended use in unoccupied dwelling units within multifamily buildings. The National Multiple Family Sub-metering and Allocation Study (2004), sponsored by the US EPA and thirteen public water suppliers in different parts of the country, demonstrated that sub-metering reduces indoor water consumption substantially, by about 16% or 7,960 gallons per household unit per year, as a mid-range estimate. Nationwide, an estimated 5.9 million additional households will be living in multifamily housing by 2030 compared with 2015 (US Energy Information Agency, *Annual Energy Outlook 2011*, Residential Sector Key Indicators and Consumption, Reference Case). If beginning in 2016 all new multifamily housing is equipped with sub-meters used for billing allocation, even a conservative savings estimate of 3,110 gallons per unit per year (the value at the lower bound of the confidence band of the 2004 National Study estimate) yields water savings of 388 million gallons per day by 2030. Additionally, the measurement of water used for landscape purposes and for outdoor water features, such as swimming pools, ornamental ponds, and fountains, is essential to the effective management and avoidance of waste in large multi-family properties. This proposal also makes clarifying changes in the language requiring metering for landscape irrigation. The landscape metering requirement should not be determined by whether a system has automatic controls or not, but rather whether the irrigation system is in-ground, and thus susceptible to hidden leaks and the malfunctioning of permanently installed equipment.

Bibliography:

National Multiple Family Sub-metering and Allocation Study (2004), sponsored by the US EPA.

Cost Impact: Will increase the cost of construction. The estimated cost to install a sub-meter in new construction is \$175. The National Multiple Family Sub-metering and Allocation Study cites \$150 per meter. Additionally, according to Northland Investment Corp, water sub-meters can be installed for \$125 to \$175 per meter (see <http://www.allbusiness.com/real-estate-rental-leasing/real-activities-related-to-real/680669-1.html>) and as per the City of San Diego, it costs \$150 - \$300 per unit to install sub-meters in new construction (See <http://www.sdn.com/sandiego/2010-04-02/politics-city-county-government/city-council-to-consider-new-water-meter-rules#ixzz0jyvUjrD>).

However, installation of sub-meters to allocate the cost of the building's water and wastewater service to individual occupants removes these utility costs from the owner's income statement and effectively increases the net cash flow and capitalized value of each rental unit.

GEW180-14: TABLE 705.1.1-OSANN1170

GEW181-14

707.11.1.1

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

707.11.1.1 Potable water applications. Where collected water is to be treated to potable water standards, wood or cedar shake roofing materials, roofing materials treated with biocides, and lead flashing are prohibited on collection surfaces. Painted surfaces are acceptable only where paint has been certified to ensure that the toxicity level of the paint is acceptable for drinking water contact. Lead, chromium or zinc-based paints are not permitted on rainwater collection surfaces. ~~Flat~~ Roofing products shall be certified to NSF P151. Rainwater shall not be collected from vegetated roof systems.

Reason: Not all Rainwater Catchment and Collection Systems are on flat roofs and NSF P151 "Health Effects from Rainwater Catchment System Components" is not limited in scope to flat roofs but is limited in scope to those components used in rainwater collection. Therefore the term "flat" is not required.

Cost Impact: Will not increase the cost of construction.

GEW181-14: 707.11.1.1-REIHELD1074

GEW182-14

707.11.2, 707.11.9, 707.12.7

Proponent: Benjamin Sojka (bsojka@rainwatermanagement.com)

Revise as follows:

707.11.2 Debris excluders. Downspouts and leaders shall be connected to a ~~roof washer~~ pre-tank filtration device and shall be equipped with a debris excluder or equivalent device to prevent the contamination of collected rainwater with leaves, sticks, pine needles and similar material. Debris excluders and equivalent devices shall be self-cleaning and shall not allow debris larger than 400 micron to pass through.

707.11.9 ~~Roof washer.~~ Pre-tank filtration device. A sufficient amount of rainwater shall be diverted at the beginning of each rain event, and not allowed to enter the storage tank, to wash accumulated debris from the collection surface. The amount of rainfall to be diverted shall be ~~field adjustable as necessary~~ sufficient to minimize storage tank water contamination. The ~~roof washer~~ pre-tank filtration device shall not rely on manually operated valves or devices, and shall operate automatically. Diverted rainwater shall not be drained to the roof surface, and shall be discharged in a manner consistent with the storm water runoff requirements of the jurisdiction. ~~Roof washers~~ Pre-tank filtration devices shall be accessible for maintenance and service.

707.12.7 ~~Roofwasher~~ Pre-tank filtration device test. ~~Roofwashers~~ Pre-tank filtration devices shall be tested by introducing water into the gutters. Proper diversion of the first quantity of water in accordance with the requirements of Section 707.11.9 shall be verified. Proper filtration of the water entering the storage tank shall be verified in accordance with Section 707.11.2.

Reason: Modern pre-tank filtration devices are a portion of an overall rainwater harvesting system. They aid in insuring a high oxygen level is maintained in the water storage tank and help to insure that the tank will rarely, if ever, require cleaning. For example, vertical, vortex type pre-tank rainwater harvesting filters have all but replaced roof washers in the rainwater harvesting industry. Roofwashers often retain moisture and material with a high organic content collects on the filter insert which results in an excellent media for bacteria growth. Vertical, vortex filters utilize surface tension (adhesion) in conjunction with a fine stainless steel filter mesh which excludes unwelcome debris. By this process about 90% of the rainwater is captured, filtered and diverted into a storage tank, while the remaining water carrying leaves and other debris is redirected to an appropriate stormwater catchment device/area. Further, with the unit having a vertical filter element, moisture and debris build up is all but eliminated making the unit virtually maintenance free. These vertical, vortex type filters are sized for specific roof capacities and as a result, do not require field adjustment which reduces potential installation errors. Good quality harvested rainwater stored in a tank is the goal, so water quality, which can be determined by particulate size entering the tank, is what should be measured during the testing phase. Simply measuring the amount of water diverted from a roof washer, which is only one type of pre-tank filtration device, limits the ability of manufacturers and installers to improve upon existing designs. Vertical, vortex style units require less maintenance and reduce the life cycle cost of the overall rainwater harvesting system because this type of pre-tank filter requires negligible maintenance and the tank may never need to be cleaned.

Vortex style units conform to European DIN 1986 standard for rainwater harvesting.

Bibliography:

Virginia Rainwater Harvesting Manual, Lawson, et al, 2009, pages 36-37.

Cost Impact: Will not increase the cost of construction. The use of modern rainwater harvesting pre-tank filtration devices, such as the vertical, vortex filter will drastically reduce the cost of a rainwater harvesting system over its life span. The initial filtration device is comparable in cost to roof washer boxes and requires no replacement filter elements and sets in place a situation where tank maintenance is minimal and may never require cleaning the interior of the tank.

GEW182-14: 707.11.2-SOJKA1035

GEW183-14

707.11.4

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

707.11.4 Collection pipe materials. ~~In buildings where rainwater collection and conveyance systems are installed, drainage piping approved for use within plumbing drainage systems shall be utilized to collect rainwater and convey it to the storage tank. Vent piping approved for use within plumbing venting systems shall be utilized for all vents within the rainwater system. Drains to a storm water discharge shall use approved waste piping. Piping for conveying rainwater to a rainwater storage tank and from a rainwater storage tank overflow and drain to a point of discharge, shall be in accordance with Chapter 11 of the *International Plumbing Code*. Piping for venting rainwater storage tanks shall be in accordance with Section 702.1 of the *International Plumbing Code*. Rainwater conveyance systems, other than piping, shall be approved.~~

Reason: Adding the reference to those materials specified in the *International Plumbing Code* keeps this section consistent with all other sections that refer to approved products as those allowed by the IPC.

Cost Impact: Will not increase the cost of construction.

GEW183-14: 707.11.4-REIHELD1177

GEW184-14

707.11.7, Chapter 12

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

707.11.7 Storage tank. The design of the storage tank shall be in accordance with CSA B126 or Sections 707.11.7.1 through 707.11.7.10.

Add new standard as follows:

CSA

B126-13 Water Cisterns

Reason: Adding CSA B126 as a reference standard offers an alternative to complying with Sections 707.11.7.1 thru 707.11.7.10 and is equivalent in content.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, CSA B126-13 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW184-14: 707.11.7-REIHELD1178

GEW185-14

707.12.10, Chapter 12

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

707.12.10 Water quality test. The quality of the water for the intended application shall be verified at the point of use in accordance with the requirements of the jurisdiction or, where the jurisdiction does not have an applicable ordinance, in accordance with CSA B128.3. Except where site conditions as specified in ASTM E 2727 affect the rainwater, collected rainwater shall be considered to have the parameters indicated in Table 707.12.10.

Add new standard as follows:

CSA

B128.3-12 Performance of non-potable water reuse systems

Reason: Adding reference to compliance with CSA B128.3 "Performance of non-potable water reuse systems" offers an alternative for jurisdictions that do not have an ordinance in place and includes methods for testing water quality.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, C SA B128.3-12 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW185-14: 707.12.10-REIHELD1180

GEW186-14

708.12.1.1

Proponent: Dru Meadows, The Green Team, Inc., representing Walmart
(dmeadows@thegreenteaminc.com)

Revise as follows:

708.12.1.1 Prohibited gray water sources. Waste water containing urine or fecal matter shall not be diverted to gray water systems and shall discharge to the sanitary drainage system of the building or premises in accordance with the *International Plumbing Code*. ~~Water from reverse osmosis system reject water, water softener discharge water,~~ Kitchen sink waste water, dishwasher waste water, and waste water discharged from wet-hood scrubbers shall not be collected for reuse within a gray water system. Reverse osmosis system reject water and water softener system backwash waste water that does not comply with Section 710.1, shall not be collected for reuse within a gray water system.

Reason: As currently written, Section 708.12.1.1 is in conflict with Section 710. Section 708.12.1.1 prohibits the use of alternate onsite sources of nonpotable water such as reverse osmosis reject water. Section 710 permits it.

This proposed new text will remove the conflict and provide consistency between the two sections.

Cost Impact: Will not increase the cost of construction.

GEW186-14: 708.12.1.1-MEADOWS682

GEW187-14

708.13.6, Chapter 12

Proponent: Lisa Reiheld, Canadian Standards Association, representing CSA Group
(lisa.reiheld@csagroup.org)

Revise as follows:

708.13.6 Storage tank tests. Storage tanks shall be tested in accordance with CSA B126 or all of the following:

1. Storage tanks shall be filled with water to the overflow line prior to and during inspection. All seams and joints shall be left exposed and the tank shall remain water tight without leakage for a period of 24 hours.
2. After 24 hours, supplemental water shall be introduced for a period of 15 minutes to verify proper drainage of the overflow system and verify that there are no leaks.
3. Following the successful test of the overflow, the water level in the tank shall be reduced to a point that is 2 inches (51 mm) below the makeup water trigger point using the tank drain. The tank drain shall be observed for proper operation. The makeup water system shall be observed to verify proper operation, and successful automatic shutoff of the system at the refill threshold. Water shall not be drained from the overflow at any time during the refill test.

Add new standard as follows:

CSA

B126-13 Water Cisterns

Reason: Adding CSA B126 as a reference standard for compliance offers an alternative to complying with requirements in Section 708.13.6 and is equivalent in content.

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, CSA B126-13 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

GEW187-14: 708.13.6-REIHELD1182

GEW188-14

706, 707, 708, 709, 710, Table 903.1, A107.3.1, A107.4.3, A107.6.2, A107.7.1, A107.8, A107.9

Proponents: Brenda Thompson, representing SEHPCAC (SEHPCAC@iccsafe.org), Craig Conner, Self, representing self (craig.conner@mac.com), Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com)

Delete without substitution:

~~Section 706 NONPOTABLE WATER REQUIREMENTS~~

~~Section 707 RAINWATER COLLECTION AND DISTRIBUTION SYSTEMS~~

~~Section 708 GRAY WATER SYSTEMS~~

~~Section 709 RECLAIMED WATER SYSTEMS~~

~~Section 710 ALTERNATE ONSITE NONPOTABLE WATER SOURCES~~

Revise as follows:

**TABLE 903.1
COMMISSIONING PLAN**

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
Chapter 7: Water Resource Conservation, Quality and Efficiency						
Appliances	X	None	—	—	—	702.6
Hot water distribution	X	None	—	—	—	702.8
Cooling tower performance	—	X	—	—	—	703.7.7
Metering	X	None	—	—	—	705.1.1
Rainwater system water quality	None	X	Field testing and verification	None	<u>707.15.4 IPC Chapter 13</u>	707.15.1
Gray water system water quality	None	X	Field testing and verification	None	<u>708.13.8 IPC Chapter 13</u>	708.13.8
Soil percolation test	X	None	Field inspection and report	Prior to installation of gray water irrigation system	None	<u>708.14.2 IPC Chapter 14</u>

(Portions of table not shown remain unchanged)

Revise as follows:

A107.3.1 Signage. Each outlet shall be provided with signage in accordance with Section ~~706.2~~ 1301.3 of the *International Plumbing Code*.

A107.4.3 Signage. The entries to rooms having water closets or urinals that are supplied with nonpotable water shall be provided with signage in accordance with Section ~~706.2~~ 1301.3 of the *International Plumbing Code*.

A107.6.2 Signage. Fire pumps connected to a nonpotable water supply shall have signage in accordance with ~~Section 706.2~~ 1301.3 of the *International Plumbing Code* provided at the building's fire command center and at each fire pump.

A107.7.1 Signage. Rooms containing process equipment supplied with nonpotable water shall be provided with signage in accordance with ~~Section 706.2~~ 1301.3 of the *International Plumbing Code*.

A107.8 Alternate onsite nonpotable water for cooling tower makeup water project elective. Where projects are intended to qualify for an *alternate onsite nonpotable water* for cooling tower makeup water project elective in accordance with ~~Section A107.7~~ A107.8, nonpotable water shall be utilized for cooling tower makeup water ~~in accordance with the requirements of Section 706.3.~~ Such water shall meet the minimum water quality requirements as established for the application by the laws, rules and ordinances applicable in the jurisdiction.

A107.9 Gray water collection project elective. Where projects are intended to qualify for a gray water collection project elective in accordance with ~~Section A107.8~~ A107.9, waste water from lavatories, showers, bathtubs, clothes washers, and laundry trays shall be collected for reuse onsite in accordance with ~~the gray water requirements of Section 708~~ the *International Plumbing Code*.

Reason: These sections are no longer needed in the IgCC because the requirements were approved for inclusion in the 2015 IPC. These sections are the "how to" for installing plumbing systems for graywater, reclaimed water, rainwater and other onsite sources of nonpotable water. These requirements are more appropriately located in the plumbing code.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GEW188-14: 706-THOMPSON1109