



2014 PUBLIC COMMENT AGENDA FOR THE PROPOSED CHANGES TO THE 2012 IgCC

October 1 — 4, 2014

Greater Fort Lauderdale Broward County Convention Center
Fort Lauderdale, Florida

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by

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INTRODUCTION

This publication contains the Public Comment Agenda for consideration at the Public Comment Hearings of the International Code Council on October 1 – 4, 2014 at the Greater Fort Lauderdale Broward County Convention Center, Fort Lauderdale, FL (see page 1). See page xxxiii for hearing schedule.

This publication contains information necessary for consideration of public comments on the proposed code changes which have been considered at the ICC Committee Action Hearings held on April 27 – May 2, at the Memphis Cook Convention Center in Memphis, TN. More specifically, this agenda addresses hearings on public comments on proposed code changes to the *International Green Construction Code*, considered by the IgCC General and IgCC Energy/Water Code Committees at the Committee Action Hearings in Memphis.

ICC GOVERNMENTAL MEMBER REPRESENTATIVES

Council Policy #28, Code Development (page xv) requires that applications for Governmental Membership must have been received by March 28 of this year in order for the representatives of the Governmental Member to be eligible to vote at this Public Comment Hearing and the Online Governmental Consensus Vote which occurs approximately one week after the hearings. Further, *CP#28* requires that ICC Governmental Member Representatives reflect the eligible voters **30 days prior** to the start of the Public Comment Hearings. This includes new, as well as changes, to voting status. Sections 9.1 and 9.2 of *CP#28* (page xxix) read as follows:

- 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.

As such, new and updated eligible voter status must be received by ICC's Member Services Department **by September 1, 2014**. This applies to both voting at the Public Comment Hearings as well as the Online Governmental Consensus Vote which occurs approximately one week after the hearings. This must be done via the Electronic Voter Designation System. Access the Electronic Voter Designation System directly by logging on to www.iccsafe.org/EVDS and using the email address and password connected to your Primary Representative account. The online form can also be accessed by logging onto "My ICC" and selecting "Designate Voters" or through the Electronic Voter Designation link in the left hand menu on the ICC home page at www.iccsafe.org. These records will be used to verify eligible voter status for the Public Comment Hearing and the Online Governmental Consensus Vote. Voting members are strongly encouraged to review their membership record for accuracy so that any necessary changes are made prior to the September 1 deadline. **Representatives of any Governmental Member that has made application for membership after March 28 will not be able to vote.**

ICC Policy on Financial Assistance for Governmental Member Voting Representatives

ICC Council Policy #CP-36 defines the circumstances under which it is permissible for Governmental Member Voting Representatives to accept funds to enable a Governmental Member Voting Representative to attend ICC code hearings. The policy seeks to prohibit, or appropriately regulate financial assistance which is designed to increase Participation by a Particular interest group or by those supporting a Particular position on a proposed code change.

Prior to receiving a voting device, each Governmental Member Voting Representative will have to sign a written certification that he/she has complied with ICC policy regarding the receipt of financial assistance in connection with attendance at the hearing. All Governmental Member Voting Representatives will be expected to be familiar with and understand such policy, and to have inquired of ICC well in advance of the hearing regarding any questions or uncertainty about the application of such policy. A Governmental Member Voting Representative who does not sign the compliance certification, or who is determined to have accepted financial assistance from a prohibited source, *will NOT be permitted to vote at the hearing*. Improper acceptance of financial assistance, or misrepresentation by a Governmental Member Voting Representative about compliance with CP-36, which are discovered after a code hearing, may result in sanctions regarding voting at future hearings by the Governmental Member Voting Representative or by other Governmental Member Voting Representatives from the same governmental member. CP-36 provides, in pertinent Part:

- 2.0. Contributions.** To allow industry and the public to contribute to the goals of the ICC in transparent and accountable processes, organizations and individuals are permitted to contribute financial assistance to Governmental Members to further ICC Code Development Activities provided that:
 - 2.1** Contributions of financial assistance to Governmental Member Voting Representatives for the purposes of enabling participation in ICC Code Development Activities are prohibited except for reimbursements by the ICC or its subsidiaries, a regional, state, or local chapter of the ICC, or the local, state or federal unit of government such Governmental Member Voting Representative is representing. For the purposes of this policy financial assistance includes the payment of expenses on behalf of the Governmental Member or Governmental Member Voting Representative. Governmental Member Voting Representatives may self-fund for purposes of participating in ICC Activities.
 - 2.2** A Governmental Member accepting contributions of financial assistance from industry or other economic interests shall do so by action of its elected governing body or chief administrative authority. A Governmental Member Voting Representative may not directly accept financial assistance from industry or other economic interests.
 - 2.3** Any contributions to a Governmental Member of the ICC shall comply with applicable law, including but not limited to a Governmental Member's ethics, conflict of interest or other similar rules and regulations.

For further information about CP-36, please visit:

<http://www.iccsafe.org/MEMBERSHIP/Pages/FinancialAssistance.aspx>

To view ICC Policy CP-36 please go to the following link:

<http://www.iccsafe.org/AboutICC/Documents/CP36-09.pdf>

ADVANCE REGISTRATION

The Public Comment Hearings are only one component of the 2014 ICC Annual Conference Group C Public Comment Hearings and Expo. **All attendees to the Public Comment Hearings are required to register. Registration for the Public Comment Hearings is FREE, and is necessary to verify voting status (see above). You are encouraged to register prior to the Public Comment Hearings. To register for the full Conference, the Education Program, or the Public Comment Hearings, go to <https://ww2.eventrebels.com>**

NOTICE: If you or your companion require special accommodations to participate fully, please advise ICC of your needs.

AGENDA FORMAT

This Public Comment Hearing Agenda includes the Consent Agenda and the Individual Consideration Agenda for the code change proposals that comprise the 2014 Code Development Cycle. This will complete the Public Comment Hearings for the 2014 Code Development Cycle.

The Consent Agenda is comprised of proposed changes to the *International Green Construction Code* which did not receive a successful assembly action or public comment, and therefore are not listed on the Individual Consideration Agenda.

The Individual Consideration Agenda is comprised of proposed changes which either received a successful assembly action or received a public comment in response to the Code Committee's action at the Committee Action Hearings.

Items on the Individual Consideration Agenda are published with information as originally published for the Committee Action Hearing as well as the published hearing results. Following the hearing results is the reason that the item is on the Individual Consideration Agenda followed by the public comments which were received.

Public testimony will follow the procedures given in *CP#28-05 Code Development* as published on page xv. Refer to the tentative hearing order on page xxxiv.

MODIFICATIONS & PUBLIC COMMENTS

In addition to modifications made by a committee at the Committee Action Hearings, *CP#28 Code Development* allows modifications to be made by the assembly at the Committee Action Hearings. In addition modifications can be proposed in form of a Public Comment following the Committee Action Hearings. The Public Comment deadline was July 16, 2014 and all Public Comments received have been incorporated into this document. **Further modifications are not permitted beyond those published in this agenda.**

Proposed changes on the Individual Consideration Agenda at the Public Comment Hearings may have up to five possible motions - Approval as Submitted, Approval as Modified by the Code Committee, Approval as Modified by a successful Assembly Action, Approval as Modified by a Public Comment, or Disapproval. A Public Comment Hearings Discussion Guide will be posted and copies available at the hearing which includes a list of allowable motions for each code change proposal.

CONSENT AGENDA

The Public Comment Consent Agenda consists of proposals which received neither an assembly action nor a public comment. The Public Comment Consent Agenda for the IgCC will be placed before the assembly at the beginning of each chapter of the IgCC with a motion and vote to ratify final action in accordance with the results of the Committee Action Hearing.

INDIVIDUAL CONSIDERATION AGENDA

The Public Comment Hearing Individual Consideration Agenda is comprised of proposals which have an assembly action or public comment. All proposed changes on the Individual Consideration Agenda shall be placed before the assembly for individual consideration of each item. The hearing order is found on page xxxiv and the agenda starts on page 1.

ICC PUBLIC COMMENT HEARING PROCESS

The hearing process will follow CP #28. The process is summarized as follows and will occur for each chapter noted in the hearing order (CP #28 sections noted):

1. At the start of the hearings:
 - Requests to withdraw code changes
 - Requests to withdraw public comments
 - Requests to revise the hearing order
 - Consent Agenda voted (Section 7.5.4)
2. The first code change on the hearing order brought to the floor with a standing motion to sustain the committee action.
3. If the Committee Action is not Disapproval, a motion to approve a modification by a public comment may be presented (Section 7.5.8.6).
4. Public testimony on either the Committee Action (if Disapproval) or the public comment (Section 5.5.1)
5. ICC Governmental Member Representatives and Honorary Members ("eligible voters") in attendance vote on the motion under consideration. (See page v)
6. Depending on the motion and action determined by the vote, subsequent allowable motions in accordance with Sections 7.3.8.6 can be considered or voting on the main motion in accordance with 7.5.8.7 is taken. (A Public Comment Hearing Discussion Guide will be posted and copies available at the hearing which includes a listing of allowable motions.)
7. The public comment hearing result on the code change determined by a vote of the eligible voters is announced. In accordance with Section 7.3.6, reconsideration is not permitted. This result will be placed on the Online Governmental Consensus Vote (Section 8.0), which will be open approximately one week after the hearings are complete (see page v).
8. Repeat 2 – 7 for subsequent code changes
9. Go the next chapter indicated on the hearing order and repeat 1 – 8.

FINAL ACTION ON CODE CHANGE PROPOSALS THAT ADDRESS THE SCOPE AN APPLICATION OF THE IgCC

Code change proposals GG6, GG9, GG10, GG17, GG73 and GG320, considered by the IgCC General Committee, address the scope and application of the IgCC. As reported at the Committee Action Hearing, the action taken by the IgCC General Committee on these proposals coupled with the final action taken during the 2014 Public Comment Hearings and subsequent Online Governmental Consensus vote will be limited to an advisory recommendation to the ICC Board of Directors who will determine the final disposition on these proposed changes in accordance with Section 1.3 of CP 28, which stipulates that the Board determines the scope of the I-Codes.

ELECTRONIC VOTING PUBLIC COMMENT HEARING FOLLOWED BY ONLINE GOVERNMENTAL CONSENSUS VOTE

This is the first time that ICC will utilize the 2 step approach to Final Action on code changes – Public Comment Hearing (PCH) voting followed by the Online Governmental Consensus Vote (OGCV) utilizing cdpACCESS™. Be sure to review the deadlines and eligible voter information on page i. The sections noted below are the applicable sections of CP #28 which is published on page xv.

Public Comment Hearing Vote

The first step is the voting that will occur at the Public Comment Hearing. This process is regulated by Section 7.5.8 of CP #28. The hearings will be run in much the same way as in the past with a couple of changes.

The Consent Agenda will be voted with a motion to ratify the action taken at the Committee Action Hearings. This will be the Final Action on those code changes and they will not be considered in the Online Governmental Consensus Vote (Section 7.5.4).

As part of the Individual Consideration Agenda, individual motions for modifications to the main motion will be dealt with by a hand vote followed by the electronic vote if the outcome of the hand vote cannot be determined by the moderator. However, in accordance with Section 7.5.8.7, the vote on the main motion to determine the PCH action must be taken electronically with the vote recorded since this is necessary for the second step in the process. As noted in Section 7.5.8.8, if the motion is not successful, motions for Approval as Submitted or Approval as Modified are in order. A motion for Disapproval is not in order. The voting majorities have not changed and are indicated in Section 7.6. As in the past, if the code change proposal does not receive any of the required majorities in accordance with Section 7.6, Section 7.5.8.9 stipulates that the PCH action will be Disapproval. However, the vote recorded will be the vote count on the main motion in accordance with Section 7.5.8.7.

Online Governmental Consensus Vote

The second step in the final action process is the Online Governmental Consensus Vote (OGCV). This is an entirely new process which is built into cdpACCESS and is regulated by Section 8.0. It is anticipated that the ballot period will start approximately one week after the Public Comment Hearings and will be open for two weeks.

The results of the PCH set the agenda and ballot options for the OGCV. This is stipulated in Section 8.1. For example, if the action taken at the PCH is AMPC 1, 3, 7 (Approved as Modified by Public Comments 1,3 and 7) then the ballot will be structured to allow eligible voters to vote for either AMPC 1,3, 7 or Disapproval in accordance with the table. The voting majority required for AMPC 1, 3, 7 at the PCH was a 2/3 majority which is the same majority that applies to the OGCV. The vote tally from the PCH will be combined with the vote tally from the OGCV to determine the Final Action. In the example cited, the combined vote tally would be required to meet the 2/3 majority in order for the final action to be AMPC 1, 3, 7. If the voting majority is less than the 2/3 required, Section 10.3 stipulates the Final Action to be Disapproval.

Be sure to review Section 8.2 which identifies the composition of the ballot. Of note is item 4 where the PCH action is Approved as Modified. The resulting text will be presented in the ballot with the modification(s) incorporated into the original code change in order for the voter to see how the text would appear in the code. A key part of this ballot is also item 10 where the voter will have access to the hearing video from both hearings.

Final Action on Proposed Code Changes

Section 10.0 regulates the tabulation, certification and posting of the final action results. In accordance with Section 10.4, the Final Action will be published as soon as practicable and will include the action and vote counts from both the PCH and OGCV.

VIEW THE PUBLIC COMMENT HEARINGS ON YOUR PC

The Public Comment Hearings are scheduled to be “webcast”. Streaming video broadcast over the Internet will provide a gateway for all International Code Council members, the construction industry and other interested parties anywhere in the world to view and listen to the hearings. Logging on to the Internet broadcast will be as simple as going to the International Code Council web site, www.iccsafe.org, and clicking on a link. [Actual site to be determined - be sure to check the ICC web site for further details].

The hearings can be seen free by anyone with Internet access. Minimum specifications for viewing the hearings are an Internet connection, sound card and Microsoft Windows Media Player. DSL, ISDN, Cable Modems or other leased-line connections are recommended for the best viewing experience. A dial-up modem connection will work, but with reduced video performance.

ICC WEBSITE - WWW.ICCSAFE.ORG

While great care has been exercised in the publication of this document, there may be errata posted for the Public Comment Agenda. Errata, if any, identified prior to the Public Comment Hearings will be posted as updates to the Public Comment Hearing Agenda on the ICC website at www.iccsafe.org. Users are encouraged to periodically review the ICC Website for updates to the 2014 Public Comment Hearing Agenda.

2012/2013/2014 ICC CODE DEVELOPMENT SCHEDULE

(Updated May/2014 – Online voting steps added)

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 via cdpACCESS only
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 4, 2014 Memphis Cook Convention Center Memphis, TN
ONLINE CAH ASSEMBLY FLOOR MOTION VOTING PERIOD	NA	NA	May 19 – 30, 2014
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	Online access via the ICC website and cdpACCESS only. Electronic version available at the ICC Bookstore.
DEADLINE FOR RECEIPT OF PUBLIC COMMENTS	August 1, 2012	July 15, 2013	July 16, 2014 via cdpACCESS only
WEB POSTING OF “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.
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
ONLINE GOVERNMENTAL CONSENSUS VOTING PERIOD	NA	NA	Starts approx. one week after the last day of PCH. Open for 2 weeks.

Notes:

- Be sure to review the document entitled “Group A, Group B and Group C Code Development Committee Responsibilities” posted at www.iccsafe.org/responsibilities which identifies committee responsibilities which are different than Group A, B and C codes which may impact the applicable code change cycle and resulting code change deadline. This document is also linked from the Public Code Change Proposal Form. As an example, throughout Chapter 9 of the IBC (a Group A code), there are numerous sections which include an “[F]” which indicates that the provisions of the section are maintained by the Fire Code Development Committee (a Group B code).
- The International Green Construction Code (IgCC) and International Swimming Pool and Spa Code (ISPSC) were subjected to a full cycle of code development in 2011 resulting in 2012 editions published in March/2012.
- Group B “Admin” includes code change proposals submitted to Chapter 1 of all the I-Codes except the IECC, IgCC, IRC, ISPSC, and the ICCPC and the administrative update of referenced standards in all the 2012 I-Codes. Proposed changes to Chapter 1 of the IECC, IgCC, IRC, ISPSC and ICCPC will be considered by the applicable Code Development Committee.
- Public Comment Hearing note: The dates indicated for the Public Comment Hearings are based on an assumed start of the hearings on the Wednesday of the respective Annual Conference. Public comment volume may dictate that the Public Comment Hearing on one or more of the codes be held on Monday afternoon (with the code completed in the Monday session) in order for the Public Comment Agenda for all the codes to be completed in the time allotted. Be sure to consult the posted Public Comment Hearing Schedule.
- A comprehensive review of the 2012 – 2014 code groupings was performed and some of the groupings have been revised for the next cycle. The 2015 – 2017 ICC Code Development Schedule has been posted and reflects the revised groupings. The 2015 – 2017 Cycle will begin with Group A code change proposals due January 12, 2015.
- This updated schedule utilizes the revised hearing terms noted in the cdp ACCESS report, as follows:

Old term

Code Development Hearing
Report of the Public Hearing
Final Action Agenda
Final Action Hearing

Revised term

Committee Action Hearing
Report of the Committee Action Hearing
Public Comment Agenda
Public Comment Hearing

2015 – 2017 ICC CODE DEVELOPMENT CYCLE & cdpACCESS™ Update

2015 – 2017 Committees

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 was June 2, 2014. In accordance with procedures, the Codes and Standards Council met to review applications and develop their recommendations for the ICC Board. The Board will be making the appointments at the Fort Lauderdale Board meeting.

Group A, Group B and Group C Code Groupings

As has been previously published, 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 xi 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 has been updated for the 2015 – 2017 Cycle and is linked from the ICC Code Development webpage as well as cdpACCESS. This matrix reflects the updated Code Groupings noted above. [Click here](#) for the matrix.

Collaboration and Code Change Submittals Utilizing cdpACCESS

The 2014 Cycle is a beta test of cdpACCESS. The program continues to be developed utilizing an “agile development” strategy which involves initial development of a module, followed by testing and then re-programming based on the test results in an iterative fashion. As of this posting, ICC is completing the Online Governmental Consensus Voting (OGCV) ballot process module.

Following completion of the OGCV module, the focus will be to get cdpACCESS up and running to allow collaboration and code change submittals for the 2015 Group A codes. Based on continuous ICC review and testing, as well as a significant user response, ICC has identified many user enhancements as well as routine bug fixes that must be completed before we can go “live” for the 2015 Cycle. We anticipate the

system to be up and running no later than November 15th. This will include the extensive database of the applicable 2015 I-Codes necessary for Group A code changes.

All 2015 code change submittals must be submitted electronically via cdpACCESS and are due January 12, 2015. The cdpACCESS word processing capabilities are not compatible with word processing programs such as Microsoft Word. As such, the development of the code change must occur within the cdpACCESS system and the system cannot accept “cut and paste” text from Microsoft Word

2015/2016/2017 ICC CODE DEVELOPMENT SCHEDULE

(Updated June 12, 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		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	March 8, 2016	March 10, 2017
COMMITTEE ACTION HEARING (CAH)	April 26 – May 3, 2015 Memphis Cook Convention Center Memphis, TN	April 17 – 24, 2016 Kentucky International Convention Center Louisville, KY	April 23 – 30, 2017 Kentucky International Convention Center Louisville, KY
ONLINE CAH ASSEMBLY FLOOR MOTION VOTING PERIOD	Starts approx. one week after last day of CAH. Open for 2 weeks.	Starts approx. one week after last day of CAH. Open for 2 weeks.	Starts approx. one week after last day of CAH. Open for 2 weeks.
WEB POSTING OF “REPORT OF THE COMMITTEE ACTION HEARING”	June 5, 2015	May 27, 2016	June 2, 2017
DEADLINE FOR cdpACCESS ONLINE RECEIPT OF PUBLIC COMMENTS	July 17, 2015	July 22, 2016	July 28, 2017
WEB POSTING OF “PUBLIC COMMENT AGENDA”	August 28, 2015	September 9, 2016	September 15, 2017
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 - 29	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/Code committees:

- 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 is 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 (code changes heard by the IPMZC code committee)
- IPSDC (code changes heard by the IPC code committee)
- IRC-M: IRC Mechanical provisions. Chapters 12 – 23 (code changes heard by the IRC - MP code committee)
- IRC-P: IRC Plumbing provisions. Chapters 25 – 33 (code changes heard by the IRC - MP code committee)
- ISPSC
- IZC (code changes heard by the IPMZC code committee)

Group B Codes/Code committees:

- Admin: Chapter 1 of all the I-Codes except the IECC and IRC. Also includes the update of currently referenced standards in all of 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 is maintained by IBC-E in Group A. See notes
- IRC-B: IRC Building provisions. Chapters 1 – 10
- IWUIC (code changes heard by the IFC code committee)

Group C Codes/Code committees:

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

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 the designation “[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 the designation “[BS]”. 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 by the IEBC code committee. The designations in the code are identified in the Code Committee Responsibilities document.
- Proposed changes to the ICC Performance Code will be heard by the code committee noted in brackets ([]) in the section of the code and in the Code Committee Responsibilities document.
- Definitions. Be sure to review the brackets ([]) in Chapter 2 of the applicable code and the Code Committee Responsibilities document to determine which code committee will consider proposed changes to the definitions.

2015 - 2017 STAFF SECRETARIES

GROUP A (2015)

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	IEBC	IFGC
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IMC	IPC/IPSDC	IPMC	IRC Mechanical	IRC Plumbing
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	Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@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	IZC			
Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org			

GROUP B (2016)

ADMINISTRATIVE Chapter 1 All Codes Except IRC	IBC-Structural Chapters 15-25	IECC-Commercial	IECC-Residential	IFC
Kim Paarlberg ICC Indianapolis Field Office 1-888-ICC-SAFE, ext 4306 FAX: 708/799-0320 kpaarlberg@iccsafe.org	Alan Carr ICC NW Resource Center 1-888-ICC-SAFE, ext 7601 FAX: 425/637-8939 acarr@iccsafe.org	Kermit Robinson Whittier Office 1-888-ICC-SAFE, ext 3317 FAX: 562/699-4522 krobinson@iccsafe.org	Dave Bowman ICC Chicago District Office 1-888-ICC-SAFE, ext 4323 FAX: 708/799-0320 dbowman@iccsafe.org	Bill Rehr/ Beth Tubbs ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehr@iccsafe.org btubbs@iccsafe.org
IRC-Building	IWUIC			
Larry Franks/ Allan Bilka ICC Birmingham District Office 1-888-ICC-SAFE, ext 5279 FAX: 205/592-7001 lfranks@iccsafe.org abilka@iccsafe.org	Bill Rehr ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehr@iccsafe.org			

2015 - 2017 STAFF SECRETARIES (continued)

GROUP C (2017)

IgCC-General	IgCC-Energy/Water
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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.

2012-2014 ICC CODE DEVELOPMENT CYCLE UPDATES TO THE 2014 REPORT OF THE COMMITTEE ACTION HEARINGS

International Green Construction Code – Energy/Water

GEW28-14: Footnote “a” should not show as struck-out.

GEW28-14

The following is errata that was not posted on the ICC website.

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.

602.1.2.2 Site to source electric power conversion. In calculating the annual energy use index, electric energy used at the site 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 ^a	1.09
Fuel Oil ^a	1.13
LPG ^a	1.12
Purchased District Heating - Hot Water	1.35
Purchased District Heating - Steam	1.45
District Cooling	0.33 x value in Table 602.1.2.1
Other	1.1

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.

Committee Action:

Disapproved

Committee Reason: The committee disapproved this change at the request of the proponent. The actions proposed by GEW28-14 were taken care of through the approval of previous actions (GEW24-14).

Assembly Action:

None

2014 PUBLIC COMMENT HEARINGS SCHEDULE
October 1 – 4, 2014
Greater Fort Lauderdale Broward County Convention Center
Fort Lauderdale, FL

The upcoming 2014 ICC Annual Conference, Group C Public Comment Hearings and Expo will be utilizing a different schedule than in years past. The Annual Business meeting will be on Monday, September 29th and the conference activities will conclude on Tuesday, September 30th with the Annual Banquet and Long Beach Preview Event. [Click here](#) for the conference schedule.

The Public Comment Hearings will start on Wednesday, October 1st at 8:00 am. The hearing schedule will follow the chapter designations in the IgCC. Be sure to consult the tentative hearing order published in the Public Comment Agenda (to be posted by August 27th) since some code changes are heard with a chapter other than the chapter in which the text is located.

The schedule anticipates that the hearings will be completed no later than 12:00 pm on Saturday, October 4th. This may require adjustments to the daily start/end times based on hearing progress.

Actual start times for each chapter cannot be stipulated due to uncertainties in hearing progress. The hearing on each chapter will begin immediately upon the completion of the hearings for the prior chapter. This includes moving the chapter up or back from the day indicated based on hearing progress. For example, if the hearing progress moves quicker than anticipated on IgCC Chapters 1 – 4 such that Chapter 4 is completed on Wednesday, Chapter 5 would start upon the completion of Chapter 4 on Wednesday.

Wednesday October 1	Thursday October 2	Friday October 3	Saturday October 4
Start 8 am	Start 8 am	Start 8 am	Start 8 am
Chapter 1	Chapter 4	Chapter 6	Chapter 8
Chapter 3	Chapter 5	Chapter 7	Chapter 9
Chapter 4	Chapter 6	Chapter 8	Chapter 10
			Chapter 11
			Appendices
End 7 pm	End 7 pm	End 7 pm	End 12 pm

Notes:

1. Daily start and end hearing times are subject to change based on progress.
2. Mid-morning, lunch and mid-afternoon breaks to be announced. The hearings are scheduled without a dinner break.
3. Code changes to Chapter 2 Definitions are considered with the applicable subject matter in the corresponding chapter (see the tentative hearing order).

TENTATIVE HEARING ORDER FOR EACH INDIVIDUAL CONSIDERATION AGENDA

Note: Code changes to be heard out of numerical order or to be heard with a different code designation are indented. Be sure to review the cross index on page xxxvi for code change which affect codes other than those under their respective code change number prefix.

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2014 ICC CODE DEVELOPMENT CYCLE

CROSS INDEX OF PROPOSED CODE CHANGES WITH PUBLIC COMMENTS

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

Listed in this index are proposed code changes that include sections or codes other than those associated with that code group. For example, IgCC Section 601.3 is proposed for revision in code change GG76-14. Chapter 6 of the IgCC is generally the responsibility of the IgCC Energy/Water Committee as listed in the table of Staff Secretaries. However Section 601.3 is being considered for revision in code change GG276-14 which is the responsibility of the IgCC General Committee. 601.3 is therefore identified in this index. Another example is Section 808.8.2 of the IgCC General Committee. Chapter 8 is maintained by the IgCC General Committee, and the proposed revision to Section 808.8.2 was considered for revision in code change GEW160, which was the responsibility of the IgCC Energy/Water Committee.

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 the IgCC Chapter 8, review the proposed code changes for the IgCC General Committee (listed with a GG prefix) then review this cross reference for the IgCC Chapter 8 for proposed code changes published in other code change groups. While care has been taken to be accurate, there may be some omissions in this list.

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:

<u>PREFIX</u>	<u>PROPOSED CHANGE GROUP (see Table of Contents on page xxxvii for location)</u>
GG	International Green Construction Code—General (Chapters 1, 3, 4, 5, 8, 9, 10, 11 and Appendices)
GEW	International Green Construction Code—Energy/Water (Chapters 6 and 7)

INTERNATIONAL GREEN CONSTRUCTION CODE	
Section #	Code Change #
CHAPTER 2	
202 - DEFINITIONS	
Bottle Filling Stations	GEW154
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, GEW26, GEW27
CHAPTER 6	
601.3	GG76
602.1	GG76
602.1	GG76
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602.1.2.3	GG76
602.2	GG76
602.2.2	GG76
602.2.3	GG76
605.1.1	GG76, GG78
603.1	GG74
604.1	GG74
CHAPTER 7	
701.1	GG74
702.7	GG74
CHAPTER 8	
808.8.2	GEW160
CHAPTER 9	
903.1	GEW3
CHAPTER 10	
1003.2.2	GEW3
1003.2.3	GEW3
1007.3	GEW1, GEW2, GEW3, GEW26, GEW27
APPENDIX A	
Appendix A	GEW1
A106	GEW3, GEW26, GEW27
A106.3.2	GEW98

2014 PUBLIC COMMENTS TO THE PROPOSED CHANGES FOR THE 2012 INTERNATIONAL CODES

CODE

PAGE

International Green Construction Code

General

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Chapter 3	61
Chapter 4	88
Chapter 5	216
Chapter 8	280
Chapter 9	332
Chapter 10	344
Appendices	384

Energy/Water

Chapter 6	427
Chapter 7	621

GG6-14

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

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: As it is an overlay code, it is important that the IgCC incorporate references to underlying codes. The action to disapprove is coordinated with prior committee action on GG2-14. This proposal does not clarify the code. It adds confusion.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

101.2 Scope. The provisions of this code shall apply to buildings which undergo 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®)~~ local building code.
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~~ local building code, the local fire code, and the ~~International Wildland Urban Interface Code~~ local wildland/urban interface code, as applicable.
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 operations.
3. The code shall not apply to temporary structures approved under ~~Section 3403 of the International Building Code~~ local 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 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.

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

102.4.2 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, the provisions of this code, shall take precedence over the provisions in the referenced code or standard.

Commenter's Reason: The concept of "overlay" needs some limits in regard to scoping, and the IgCC should be clear that provisions which could conflict with the building code, the fire code, and other adopted codes should not be introduced. The essential change from the original proposal is to refer to locally adopted codes instead of the International Codes, since the correct edition is immediately in question when referring to the International Codes directly. Where the IgCC specifically refers to other International Codes in the text, then the applicable International Code listed in Chapter 12 would still be effective to the prescribed extent of the reference, by virtue of Section 102.4. A blanket reference making all the International Codes "part of" the IgCC is not a good way to express the overlay concept, especially without clear scoping distinctions.

GG6-14

GG9-14

101.3, 301.1.1, 302.1, Table 302.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended this proposal be disapproved in order to preserve flexibility for owners and designers regarding the option to use ASHRAE 189.1 instead of the IgCC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Garrett Stone, Energy Efficient Codes Coalition, representing Energy Efficient Codes Coalition (gas@bbrslaw.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello, American Council for an Energy Efficient Economy (misuriello@verizon.net) Approve as Submitted.

Commenter's Reason: We recommend that this proposal be Approved As Submitted because it will improve code compliance and enforcement in two important ways. First, it eliminates cherry-picking requirements from the IgCC and ASHRAE 189.1 by clarifying that when ASHRAE 189.1 is selected, all of the provisions of ASHRAE 189.1 apply. Section 301.1.1 of the 2012 IgCC could be

misinterpreted to allow code users to choose between individual requirements of the IgCC and ASHRAE 189.1. This proposal eliminates that potential source of confusion.

Second, the proposal elevates the choice between IgCC and ASHRAE 189.1 to the jurisdictional level. Because the jurisdiction will ultimately have to understand and enforce the green code, it is crucial that the jurisdiction have control over which green code or codes are acceptable. Requiring jurisdictions to enforce two different green codes based on user-choice decreases the likelihood the jurisdiction will adopt the IgCC. Moreover, if they adopt the IgCC anyway, user-choice increases the likelihood of confusion and doubles the cost to the jurisdiction by requiring training on two different codes. This is inconsistent with the notion of one uniform set of codes that is embodied in most of the ICC's work.

GG9-14

GG10-14

101.3, 301.1.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee disapproved this proposal because it would undercut other requirements in the code, creates confusion and does not improve the code. In addition, it is important to retain the reference to Exceptions 1 through 3 in Exception number 4. Without the references to Exceptions 1 through 3, the scope of the IgCC and ASHRAE 189.1 might be confused with regard to low-rise residential structures.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Kathleen Petrie, City of Seattle, Department of Planning and Development, representing City of Seattle, Department of Planning and Development (kathleen.petrie@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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. Projects Buildings and building sites complying with the requirements of ASHRAE 189.1 shall not be required to comply with the requirements of this code.

Commenter's Reason: In Public Version 2.0 of the IgCC, Item #4 of Section 101.3 directed the jurisdiction to Section 301.1.1 and Table 302.1 where they would identify to applicants whether or not ASHRAE 189.1 was allowed to be used as an alternate path to the IgCC. In the final code cycle preceding the publishing of the 2012 IgCC, changes were made which removed that choice from the jurisdiction and made ASHRAE 189.1 an outright compliance path if the applicant chooses. These changes created a broken loop between item #4 of Section 101.3 and Section 301.1.1 which this public comment attempts to resolve.

Item #4 of Section 101.3 has been modified to clearly state the allowed exception for ASHRAE 189.1, so Section 301.1.1 has been deleted because there is no need for it any longer. Feedback was provided at the IgCC Hearings in Memphis that the term "Projects" used in revised Section 101.3 was ambiguous, so the language has been modified to say "buildings and building sites" which is a term used consistently in the IgCC.

It is appropriate that the allowance for the use of ASHRAE 189.1 is clear in the scoping section of the code, rather than the section devoted to "Jurisdictional Requirements and Life Cycle Assessment".

GG10-14

GG17-14

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

Proposed Change as Submitted

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:

- 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.
- 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.
- 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/gov.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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal adds confusion. There are problems with some of the items on the list. This may be a good idea, but it needs work. The proposal changes the scope of the IgCC and modifies ICC 700 to remove the Bronze performance level.

Assembly Action:

None

Analysis: For staff analysis of the content of ASTM E2921-13 with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Mike Collignon, representing Green Builder Coalition (mcollignon@greenbuildercoalition.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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.

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 with a performance level of Silver or above or Section 304.	<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 with a performance level of Silver or above or Section 304.	<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 with a performance level of Silver or above or Section 304.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged)

304.1 Low Rise Residential Construction. Where projects that include residential buildings not more than 3 4 stories in height above grade plane are 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. ~~1. Improved landscaping shall be native or Xeriscape. Where new landscaping is installed as part of a site plan or within the building site, native plants shall be installed in accordance with Section 405.3~~
4. ~~2. Automatic irrigation system controllers shall include weather- or soil moisture-based controllers that automatically adjust irrigation rates in response to changes in weather conditions. Where a new landscape irrigation system is installed, the irrigation system shall comply with Section 404.~~
5. ~~3. Termite control consisting of non-toxic materials such as baiting systems borate treatment, physical barriers and or pest-resistant building materials shall be provided.~~
6. ~~4. A construction waste management plan in accordance with Section 503.1 shall be provided.~~
7. ~~5. Wood used to construct the building or other elements on the building site shall not be tropical wood.~~
8. ~~6. Dwellings and dwelling units 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. ~~7. Building service water heater heating systems shall comply with Sections 607 and 702.8.~~
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. ~~8. Tank type toilets and water closets shall be certified and listed as compliant with the U.S. EPA WaterSense tank-type toilet specification, have a flush rate of not more than 1.28 gallons.~~
13. ~~9. Lavatory faucets shall be certified and listed as compliant with the U.S. EPA WaterSense specification have a flow rate of not more than 1.5 gpm.~~
14. ~~10. Shower heads shall have a flow rate of not more than 2.0 gpm. Wall-mounted showerheads shall be certified and listed as compliant with the U.S. EPA WaterSense specification.~~
11. ~~Kitchen faucets shall have a flow rate of not more than 1.8 gpm. Kitchen faucets are permitted to temporarily increase the flow above the maximum rate, but not to exceed 2.2 gpm and shall automatically revert to the maximum flow rate of 1.8 gpm upon release of the operating handle or lever.~~
12. ~~Residential flushing urinals shall be certified and listed as compliant with the U.S. EPA WaterSense flushing urinal specification.~~
15. ~~13. 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.~~
14. ~~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.~~
15. ~~Emissions from composite wood products, adhesives and sealants, architectural paints and coatings, flooring and insulation shall be limited in accordance with Section 806.~~

- 18 ~~16.~~ Where installed, 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 ~~17.~~ Space and water heating equipment shall be closed- sealed combustion or power and direct-vented or located in a space atmospherically isolated from the conditioned area 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.~~
- 23 ~~18.~~ Buildings in radon zone 1 shall comply with the radon-resistant construction requirements of Appendix F of the International Residential Code.
- 24 ~~19.~~ 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.

Commenter's Reason: As of July 2014, the IgCC has been adopted in 11 jurisdictions and 2 states, while the ICC-700 standard has only been adopted in 3 jurisdictions. 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 the ICC-700 standard 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.

GG17-14

GG18-14

101.5

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved because they felt that it was unreasonable and because the term "reasonable," as used in the proposal, is not an enforceable term.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jonathan Humble, American Iron and Steel Institute, representing American Iron and Steel Institute (jhumble@steel.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

101.5 Intent. ~~The purpose of this~~ This code is ~~intended to establish~~ safeguard ~~the minimum requirements to provide environment, and provide~~ a reasonable level of safety for the environment and protection of public health 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 not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

Commenter's Reason: We are proposing that GG18-14 be "Approved as Modified". The basis for our recommendation is:

Point #1: Greater consistency with the code change proposal ADM16-13, which modified all I-code intent sections (See reference below).

Point #2: Greater consistency when discussing the environmental aspect which is outside of ADM16-13, and where the use of the existing term "safeguard" is more appropriate.

For Reference: ADM6-13 - Public Comment

IBC [A] 101.3 Intent. The purpose of this code is to establish the minimum requirements to provide a reasonable level of ~~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 a reasonable level of safety to fire fighters and emergency responders during emergency operations.

GG18-14

Final Action: AS AM AMPC____ D

GG19-14

101.5

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved because the term "safety" includes "fire safety."

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Marcelo Hirschler, GBH International, representing North American Flame Retardants Alliance (gbhint@aol.com) request Approve as Modified by this Public Comment.

Modify the proposal 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 any aspect of safety, health or environmental requirements under other applicable codes or ordinances.

Commenter's Reason: It is essential that all safety considerations be included. In particular, fire safety is one of the considerations that must be included when considering the implications of an overlay code.

The sentence originally proposed to be modified by proposal GG19 was deleted by proposal GG20 because it was a duplication of the same sentence in section 101.2 Therefore this public comment proposes to make a change in the corresponding (identical) sentence in 101.2.

Since the committee stated that fire safety is one aspect of safety, it is important to point out that this code is not intended to abridge or supersede any aspect of safety (which would include fire safety), since fire safety is believed by some not to be an important part of a green construction code and that is not correct.

GG19-14

GG26-14

102.4

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The concepts of codes and standards need to be treated separately. The proposed change becomes a reason *not* to adopt the IgCC.

Assembly Motion:

As Submitted

Online Vote Results: Successful -

Support: 62.57% (117) Oppose: 37.43% (70)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Assembly Action requests Approve as Submitted.

Commenter's Reason: This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action. The assembly action for Approve as Submitted was successful by a vote of 62.57% (117) to 37.43% (70) by eligible members online during the period of May 19 - May 30, 2014.

Public Comment 2:

David Collins, representing The American Institute of Architects (dcollins@preview-group.com) requests Approve as Submitted.

Commenter's Reason: The AIA supports the approval of GG26 as originally submitted. Section 102.4 of the IgCC contains many references to codes that are used to regulate construction when adopted by the local jurisdiction that enforces the codes. The IgCC states that compliance with these standards is necessary for compliance with the IgCC. This code change proposal is a clarification to the code user that the version of these codes must be the version of the IgCC adopted by local jurisdictions, whether that version has been amended by the jurisdiction or not.

Municipalities often use the option to retain older versions of codes. There should not be an automatic reference to standards that have not been adopted. Such provisions can be misleading and confusing to the end users, agencies examining the code for adoption and those charged with compliance.

We urge the membership to vote to approve this change as submitted and guarantee that the codes adopted by the jurisdiction are the codes to be used in the design, construction and application of this code.

Public Comment 3:

Garrett Stone, Energy Efficient Codes Coalition, representing Energy Efficient Codes Coalition (gas@bbrslaw.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello, American Council for an Energy Efficient Economy (misuriello@verizon.net) request Disapprove.

Commenter's Reason: We recommend that this proposal be Disapproved because it is inconsistent with the concept of the IgCC being an overlay code to the other International Codes. The success and effectiveness of the IgCC depends on the strong foundation already laid by the complete family of International Codes. The IgCC cannot be an "overlay" code in isolation from these other important building codes.

Some concern was raised at the Committee hearing about whether this section requires a jurisdiction to adopt the I-Codes. Section 102.4 requires the project itself to comply with the referenced I-Codes, not the jurisdiction that adopted the IgCC. If a jurisdiction has adopted a different edition of an I-Code, or a different code altogether, that jurisdiction can, of course, add to or modify the referenced codes list. However, if this proposal is successful, it would only require compliance with building, fire, structural, and other requirements if formally adopted by the jurisdiction - essentially changing the requirement from an "opt-out" to an "opt-in." We believe the default should always be the nation's only complete set of building codes - the International Codes. To allow green buildings to be constructed without a basic set of building requirements could lead to quality and safety concerns in green buildings around the country.

GG26-14

GG27-14

102.4

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved because it requires the jurisdiction to adopt all International Codes. Where they have not, it requires them to amend the IgCC and remove the references to the International Codes. This proposal does not adequately address site related issues. The intent of this proposal is already addressed in Section 101.2.

Assembly Action:

None

Analysis: For staff analysis of the content of ASHRAE 62.2 with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Garrett Stone, Energy Efficient Codes Coalition, representing Energy Efficient Codes Coalition (gas@bbrslaw.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello, American Council for an Energy Efficient Economy (misuriello@verizon.net) request Approve as Submitted.

Commenter's Reason: We recommend that this proposal be Approved As Submitted because it would clarify that the relevant requirements of the other International Codes must be met in addition to the IgCC requirements before a building can be considered "green".

We believe that the Committee misunderstood the proposal. GG27 does not require jurisdictions that adopt the IgCC to adopt all of the International Codes and apply them to all buildings as the Committee thought. However, GG27 does confirm what we already believe is already an existing requirement of the IgCC -- that in order for an individual building to comply with the IgCC, that building must also meet the referenced International Codes.

The current Section 102.4 requires that a specific list of I-Codes "shall be considered part of the requirements of [the IgCC]...." We believe that the only reasonable interpretation of this section is that the listed I-Codes must be met in green buildings. Otherwise, the section serves no purpose. Although the Committee debated at length how to deal with referenced codes and standards, the IgCC is an integral part of the complete I-Code family. Proposal GG27 adds another sentence to Section 102.4 to better clarify the applicability of the referenced I-Codes to projects complying with the IgCC and to avoid any continuing misinterpretation of this section.

The International Codes have seen widespread adoption because they provide a complete set of building requirements for nearly every building type and because the primary base code (the IBC) references and requires compliance with the other codes.

As a part of the complete I-Code family, the IgCC must be consistent with and reference the other International Codes. The IgCC would gain more widespread credibility and acceptance if it could show that any building built to the IgCC is not only green, but also meets the national model codes in all other aspects - fire, structural, plumbing, energy efficiency, electrical, etc. By contrast, it would frustrate the cause of the IgCC (and green building in general) if a building could be certified "green," and still fail any of the other important building code requirements.

GG27-14

GG29-14

102.4.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposed language is convoluted and would not improve the code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Marcelo Hirschler, representing North American Flame Retardants Alliance (gbhint@aol.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 the International Codes listed in Section 102.4, as applicable, shall take precedence over the provisions of this code, which, in turn, shall take precedence over the provisions in the referenced code or standard.

Commenter's Reason: Just as the base I-codes are typically in place as the foundation for the built environment - and then the IgCC is added, this revision clarifies the same order of precedence when there is a conflict. The base I-codes, followed by the IgCC and then followed by any other referenced code or standard.

GG29-14

GG31-14

102.7

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The existing language is clearer.

Assembly Motion:

As Submitted

Online Vote Results:

Failed - Support: 46.88% (75) Oppose: 53.13% (85)

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

David Collins, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com) requests Approve as Submitted.

Commenter's Reason: AIA supports the approval of this proposal as originally submitted. GG31 deletes the provisions referencing the mixed occupancy building requirement (Section 102.7) as there are no use-specific requirements in the IgCC referencing an occupancy, let alone a mixed occupancy. This proposed change is appropriate given that the current code language is unnecessary and implies the existence of use-specific provisions and mixed-use conditions will change the direction of the code and its application. That is simply not true and these criteria are simply not in the IgCC.

We ask the membership to vote to approve this code change as submitted.

GG31-14

GG39-14 202 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal 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.

Committee Reason: This proposal provides definitions that clarify and enhance the code's life cycle assessment provisions. As the definitions do not address "potential," the term "potential" was deleted from each definition title by the modification.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

Acidification. The dissolved acid from fossil fuel combustion used in ~~electricity production~~ buildings, heating industry, and fossil-fueled transportation and deposited by rain into ecosystems.

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

Commenter's Reason: The proposed revisions will improve the definitions.

Public Comment 2:

Martha VanGeem, representing self; Emily Lorenz, representing self (emilyblorenz@gmail.com) request, Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

Smog. Emissions, primarily from incomplete combustion of fossil-fuel from industry and fossil-fueled transportation, trapped at ground level (troposphere) reacting with sunlight producing photochemical smog. Also known as tropospheric ozone or ground level ozone.

Commenter's Reason: Clarify definition of smog and also reference the other common terms for smog: ground level ozone or tropospheric ozone.

GG39-14

GG51-14

202, 202 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

As Submitted

This code change proposal was heard by the IgCC Energy/Water Committee.

Committee Reason: The committee agreed with the proposal as it simplifies the definition and removes excess information which is commentary in nature.

Assembly Motion:

Disapprove

Online Vote Results:

Successful - Support: 53.85% (84) Oppose: 46.15% (72)

Assembly Action:

Disapproved

Individual Consideration Agenda

Public Comment 1:

Steven Rosenstock, Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

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

GROUND SOURCE. See "Geoexchange Geothermal".

Commenter's Reason: This modification will improve the proposal. As shown on the following web site, <http://www.geoexchange.org/>,

"GeoExchange® and the GeoExchange® logo are registered trademarks of the Geothermal Heat Pump Consortium, Inc"

Rather than use a trademarked word, it would be better to use a term that commonly used with these types of heating and cooling systems. The term "geothermal" is also used for the EPA Energy Star Geothermal Heat Pump program, and it is not trademarked.

Public Comment 2:

Assembly Action requests Disapprove.

Commenter's Reason: This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action. The assembly action for Disapprove was successful by a vote of 53.85% (84) to 46.15% (72) by eligible members online during the period fo May 19 - May 30, 2014.

Public Comment 3:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Disapprove.

Commenter's Reason: I agree with the proponent's intent to try to simplify the code by getting rid of extraneous information but disagree that the word "geoexchange" is commonly used to describe these systems. Firstly, "geoexchange" is a registered trademark and the IGCC would need to get permission to use it from the trademark owner. Moreover, use of trademarked terms is not permitted by the ICC.

In addition, the 800 pound elephant in the room is that most people refer to these systems as "geothermal" including the Dept of Energy, US EPA, many state laws, most manufactures and others!! To simplify the code the IGCC should use terminology that is used in the building community, in this instance, geothermal heat pumps.

Please disapprove this proposal.

GG51-14

GG54-14 202

Proposed Change as Submitted

Proponent: Doug Johnson, representing California Invasive Plant Council (dwjohnson@cal-ipc.org); Read Porter, Environmental Law Institute (porter@eli.org); Wendy Brown, Washington Invasive Species Council; Brian Arnold, Southeast Exotic Pest Plant Council; Katherine Howe, Midwest Invasive Plant Network; Nancy Lowenstein, Alabama Invasive Plant Council

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The Committee agreed with the proponent's published reason statement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Greg Johnson, Johnson & Associates Consulting Services, representing Greenscapes Alliance (gjohnsonconsulting@gmail.com) requests Disapprove.

Commenter's Reason: Removing the phrase "consideration for inclusion" from the definition makes all of the following lists mandatory in application regardless of geographic relevance.

This means that a plant that is naturalized without harmful environmental impacts in one location would still be required to be declared invasive if it was identified as noxious or invasive in any other location just because it is on a list.

The "consideration for inclusion" language allows discretionary application of the requirement by the code official to best address the specifics of the site. It does not, as stated in the proponent's reason statement, leave "the determination of invasive plants entirely up to the builder."

The proposal also does not, as the proponent states, close a loophole. Instead it removes the code official's discretionary authority and should therefore be disapproved.

GG54-14

GG56-14

202

Proposed Change as Submitted

Proponent: Doug Johnson, representing California Invasive Plant Council (dwjohnson@cal-ipc.org); Read Porter, Environmental Law Institute (porter@eli.org); Wendy Brown, Washington Invasive Species Council; **Brian Arnold**, Southeast Exotic Pest Plant Council; Katherine Howe, Midwest Invasive Plant Network; Nancy Lowenstein, Alabama Invasive Plant Council

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal adds clarification to the definition and expands the basis for native plants.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Greg Johnson, Johnson & Associates Consulting Services, representing Greenscapes Alliance (gjohnsonconsulting@gmail.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 by:

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

Commenter's Reason: Replacing the word "on" with "by" resolves a grammatical error in the text. Plant species are identified "by" laws rather than "on" laws.

Replacing the word "and" with "or" in item 2 allows any of the three identified types of state laws to individually serve as a determinant of invasiveness; using "and" as the conjunction requires a plant species to be co-identified in all three types of laws to qualify as invasive.

Except for "regional" all of the specified laws and lists are specifically developed by governmental authorities; striking the word regional and replacing it with a reference to government maintains that practice and is internally consistent. It also still accommodates regional governmental authorities.

Note that non-governmental lists may also be used as reference because of the "shall not be limited to" language of the main paragraph so regional non-governmental lists are not excluded.

GG56-14

GG58-14

202, Chapter 12

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There are errors in the referenced list. State lists may be more responsive. A website reference is not a good idea.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Greg Johnson, Johnson & Associates Consulting Services representing The Greenscape Alliance (gjohnsonconsulting@gmail.com) requests Approve as Modified by this Public Comment.

Replace proposal 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.US
3. Federal laws.
4. USDA RCS, The PLANTS Database

Add new standard(s) as follows:

USDA, RCS. 2014. The PLANTS Database

Commenter's Reason: The PLANTS database provides a definitive reference for the native status of plants where none other may exist. It's use should be explicitly recognized.

GG58-14

GG60-14 202

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proponent requested disapproval in order to bring the proposal back with improvements in the public comment period. It may not be necessary to define what plastic is. In the reason statement, 2 of the 3 sections cited do not mention plastics and the third only mentions plastics as related to tinting.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Marcelo Hirschler, GBH International, representing GBH International (gbhint@aol.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

PLASTIC. See "Polymeric A synthetic material" that consists of large molecules containing carbon, made from a wide range of organic polymers, that can be fabricated into building products.

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.

Commenter's Reason: The term "plastic" is used both in the IgCC and in the referenced ASHRAE standard (ASHRAE 189.1, used for as an alternate for some buildings) and a definition would be useful. In particular it is important to distinguish between plastics (which are synthetic materials) and natural polymeric materials (including wood, cotton or wool). Also, a definition of the term "plastic" in the IgCC is a way of making a distinction from other typical building materials, such as wood, metal or glass. Plastics are, correctly, listed in Chapter 9 of ASHRAE 189.1 among the building materials that can be recycled, but not everyone understands exactly what plastics are.

Public Comment 2:

Richard Krock, The Vinyl Institute, representing The Vinyl Institute (rkrock@vinylinfo.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

PLASTIC. See "Polymeric A synthetic material" that consists of large molecules containing carbon and other elements, made from a wide range of organic polymers and typically containing other compounded ingredients, that can be fabricated into building products.

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.

Commenter's Reason: Defining "Plastic" is useful in the Code in order to differentiate this type of material from others such as glass, wood, stone, or metal from the perspective of properties, performance, durability, sustainability, carbon footprint, life cycle inventory, and recycling.

GG60-14

Proposed Change as Submitted

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

Public Hearing Results

The following is errata that was not posted to the ICC website:

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~~.

(Errata already incorporated into cdpACCESS.)

Committee Action:

Disapproved

Committee Reason: The existing definition is more inclusive to all components that make up a vegetative roof.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC); David Collins, representing The American Institute of Architects (dcollins@preview-group.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

202 VEGETATIVE ROOF ROOFTOPS. Interacting components ~~on or integral to~~ above the roof that includes vegetation, gardens or landscaping.

405.1.5 Engineered growing media. Where engineered growing media are used onsite, including, but not limited to vegetative roofs-rooftops, trees located within hardscape areas, and special soils specified for wetlands and environmental restoration sites, such media shall comply with the best available science and practice standards for that engineered growing media and use.

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 roofs-rooftops 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:

- Solar thermal collectors.
- Solar photovoltaic systems.
- Roof penetrations and associated equipment.
- Portions of the roof used to capture heat for building energy technologies.
- Rooftop decks and rooftop walkways.

408.3.2 Vegetative roofs-rooftops. Vegetative roofs-rooftops, 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.

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 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

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST-OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
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
Vegetative roofs <u>rooftops</u>	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

(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 rooftops 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.
- 4.4 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.
- 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.

D107.1 Imminent hazard. When, in the opinion of the *code official*, there is an imminent hazard to the building site or to surrounding public and private property resulting from the failure of a building or building site system, including but not limited to: stormwater management systems; erosion control measures; gray water or rainwater collection systems; or dry vegetation used for vegetative ~~roofs~~ rooftops or hardscape shading; which endangers life or which will cause irreparable harm to environmental systems on, or adjacent to, the building site, the code official is hereby authorized and empowered to order immediate repair of these systems and measures to restore proper operation.

Commenter's Reason: The committee reason indicated that "The existing definition is more inclusive to all components that make up a vegetative roof." The committee missed the point of this proposal. The point is that insulation is not needed in roof assemblies that are constructed over non-conditioned spaces such as, but not limited to, parking garages. Furthermore, vegetation should not be depended upon for waterproofing. That is why the proposal deletes such language. The companion definition in ASHRAE 189.1 does not address insulation either.

This SEHPCAC public comment for AMPC further modifies the proposal to clarify that the vegetative portions of a vegetative roof are located above the "roof covering," which is the portion of the roof that provides the waterproofing function.

This public comment also changes the term from "vegetative roofs" to "vegetative rooftops" in every location that the term is used in the code. This was done at the request of roofing industry experts so as not to confuse "roofs," which are also defined in other standards, with the vegetative materials that may sit atop them. Such vegetative materials are also known in the roofing industry as "vegetative overburden." The term "vegetative rooftop" was seen by the SEHPCAC as a reasonable and readily understandable compromise between the terms used by the "green" community and the roofing industry.

This comment 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>.

GG68-14

GG72-14

301.1.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal does not clarify the code and is unnecessary. The language proposed belongs in Chapter 1, not in Chapter 3.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Garrett Stone , Energy Efficient Codes Coalition, representing Energy Efficient Codes Coalition (gas@bbrslaw.com) requests Approve as Submitted.

Commenter's Reason: We recommend that this proposal be Approved As Submitted for the following reasons:

- First, it reorders the options for compliance with the IgCC in Section 301.1.1, so that the primary means of compliance with the IgCC is via the provisions of the IgCC, and ASHRAE 189.1 is only an alternative compliance option (and not vice-versa).
- Second, it will facilitate compliance and enforcement because it prevents code users from cherry-picking requirements from IgCC and ASHRAE 189.1 (the user must either comply fully with one or the other).
- Third, like proposal GG27, it would require that any building built to the IgCC must also meet the other basic building code requirements for the International Codes referenced in Section 102.4. The ICC has the most complete set of building codes, covering key requirements for nearly every building type. The IgCC should be an integral part of the I-Codes, not a means of avoiding important building requirements.
- Finally, since Section 301.1.1 is entitled "Application" and already reiterates compliance options from Chapter 1, this is the appropriate spot to clarify the application of other codes to the ASHRAE 189.1 compliance path.

GG72-14

GG75-14

302.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal contains redundant information that is already in the code and, therefore, is unnecessary. This requires a reach back to ICC 700, while the scope of the IgCC clearly delineates the two.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Garrett Stone, Energy Efficient Codes Coalition, representing Energy Efficient Codes Coalition (gas@bbrslaw.com) requests Approve as Submitted.

Commenter's Reason: We recommend that this proposal be Approved As Submitted because it closes an important gap between the International Codes and ICC 700. Although there has been much debate over whether to reference ICC 700 in the IgCC, as long as the reference remains in Section 302.1, it is crucial that all green buildings - whether built to the IgCC, ASHRAE 189.1, or ICC 700 - meet the fundamental building code requirements contained in the International Codes.

Green buildings should offer owners and occupants all of the advantages of modern building practices - fire safety, structural integrity, energy efficiency, etc. One of the ICC's strengths is its ability to offer a self-referencing, integrated set of building codes that cover all aspects of the building.

We do not agree with the Committee that this reference is "redundant." While under the best interpretation of current IgCC language, users of ICC 700 under this section would also need to meet I-Codes under Section 102.4, this proposed provision clarifies that requirement specifically as to ICC 700 in order to remove any doubt. Without the proposed reference, a user of ICC 700 may not realize this requirement. Moreover, we submit that for any building to claim "green" status, it must at least meet the minimum energy code. Yet ICC 700 does not currently require compliance with the IECC in all compliance paths. This proposal will correct that problem for those jurisdictions that adopt ICC 700 as part of the adoption of the IgCC.

Green codes such as the IgCC, ASHRAE 189.1 and ICC 700 cannot exist on an island without the other I-Code requirements. Moreover, if we believe that the other requirements of the I-Codes are important, this provision, like others on this subject, would help to promote proper utilization of the I-Codes when building a green building to the benefit of public health and safety.

GG75-14

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

Proposed Change as Submitted

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 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.

$$\text{CO}_2\text{e pd} \geq (\text{zEPI} \times \text{CO}_2\text{e srbd})/57 \quad \text{(Equation 6-2)}$$

where:

zEPI = the minimum score in accordance with Section 602.1.1.

CO₂e pd = emissions associated with the proposed design.

CO₂esrbd = 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 <u>performance is at least 3% lower than required by Table 302.1</u>	1 elective

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A106.1	Project zEPI is at least 10 points performance is at least 6% lower than required by Table 302.1	2 electives
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

Public Hearing Results

Committee Action:

Disapproved

This code change proposal was heard by the IgCC Energy/Water Committee.

Committee Reason: The committee believes that zEPI needs to remain as the scale for the determination of compliance under this approach in Chapter 6. This proposal among its many actions would remove zEPI. The various pieces of this proposal don't seem to work together. Sections proposed for deletion are still referenced in other text that is retained. .

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Modified by this Public Comment.

Modify the proposal 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 and an enhanced 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 CO ₂ e EMISSION REDUCTION			
302.1, 302.1.1, 602.2	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.	Minimum reduction in energy use %	
<u>302.1</u> <u>603</u>	<u>Enhanced annual energy performance - The jurisdiction shall indicate 100% minus the value in this table shall be used in Formulas 6-XX and 6-YY</u>	_____ %	
604.1	Automated demand response infrastructure	<input type="checkbox"/> Yes	<input type="checkbox"/> No

(Portions of table not shown remain unchanged.)

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, 610 and 611 and shall comply with either Section 602 or 603.

SECTION 602 zEPI MODELED PERFORMANCE PATHWAY REQUIREMENTS

SECTION 603 IECC BASED PERFORMANCE-BASED COMPLIANCE

603.1 Performance based compliance IECC based modeling. 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 unit measure based on compliance with Section 603.2. Predictive CO₂e emissions modeling shall be in accordance with Section 603.3.

603.2 Energy performance modeling. Performance-based designs shall demonstrate that the building energy use is 10% or less than the baseline building as determined in accordance with Equation 6-xx.

$$EU_p < 90\% \times EU_b \quad (\text{Equation 6-xx})$$

where:

EU_p = the proposed energy use expressed in source kBtu for the proposed design of the building and its site calculated in accordance with Section 603.2.1.

EU_b = the base annual energy use expressed in source kBtu for a baseline building and its site calculated in accordance with Section 603.2.1.

90% = Represents 10 percent reduction in energy use below baseline IECC code building

Exception: When a jurisdiction indicates a greater than 10% reduction in Table 302.1, buildings under 25,000 square feet shall comply with unaltered Equation 6-xx.

603.2.1 Modeling methodology. The proposed building performance and the baseline building performance of the building and building site shall be calculated in accordance with Section C407 of the *International Energy Conservation Code*, as modified by Section 603.2.1.1 and Section 603.2.1.2. The annual energy use modeling shall include all energy used for building and site functions and anticipated occupancy.

603.2.1.1 Energy units. The building performance calculation results from Section C407 of the *International Energy Conservation Code* shall be based on energy use instead of energy cost. Energy use shall be converted to consistent units by multiplying the Btus of fossil fuel use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 603.2.1.1 based on the geographical location of the building.

**TABLE 603.2.1.1
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural gas	1.09
Fuel Oil	1.13
LPG	1.12
Purchased District Heating - Hot Water	1.35
Purchased District Heating - Steam	1.45
District Cooling	0.33 x value in Table 603.1.2.1
Other	1.1

603.2.1.2 Site to source electric power conversion. In calculating the proposed building performance and the baseline building performance, electric energy used shall be calculated in source energy by multiplying the electric power use at the utility meter or measured point of delivery in Btus by the conversion factor in Table 603.2.1.2 based on the geographical location of the building.

**TABLE 603.2.1.2
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA**

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
MROE	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

<u>eGRID 2007 SUB-REGION ACRONYM</u>	<u>eGRID 2007 SUB-REGION NAME</u>	<u>ENERGY CONVERSION FACTOR</u>
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	3.95

603.3 CO₂e emissions testing. The CO₂e emissions for the proposed and baseline building and building site shall be based on the proposed and baseline building performance calculated in accordance with Sections 603.2.1 and as modified by Sections 603.3.1 and 603.3.2. The emissions associated with the proposed design shall be less than the CO₂e emissions associated with the standard reference design in accordance with Equation 6-yy.

$CO_2e_{pdp} < (90\% \times CO_2e_{bbp})$ (Equation 6-yy)

where:

90%=the minimum score in accordance with Section 603.2.

CO₂e_{pdp}=emissions associated with the proposed building performance.

CO₂e_{bbp}=emissions associated with the baseline building performance.

603.3.1 CO₂e emissions from electricity. Emissions associated with use of electric power 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 603.3.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 603.3.1
ELECTRICITY EMISSION FACTORS BY EPA eGRID SUB-REGION**

<u>eGRID 2007 Subregion Acronym</u>	<u>eGRID 2007 Subregion name</u>	<u>2005 CO₂e RATE (lbs/MWh)</u>
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 New York	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

603.3.2 Onsite nonrenewable energy. Emissions associated with the use of nonrenewable energy sources other than electrical power 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 603.2.2. Emissions associated with purchased district cooling shall be calculated by multiplying by the factors from Table 603.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 603.3.2
FOSSIL FUEL EMISSION FACTORS**

<u>Stationary Fuel Type</u>	<u>Emission Factor</u>
Natural Gas	137.35
Fuel Oil	200.63
Propane	162.65
Other Fossil Fuels	250.00
Purchased District Energy - Hot water and steam	150.00

Commenter's Reason: The SEHPCAC is re-issuing their proposal to meet the concerns of the committee and to provide a clear, alternate path for performance based compliance. Great interest has been shown to having an alternate compliance path to zEPI that maintains the same level of energy efficiency as zEPI, but uses the I-codes for determining compliance. The SEHPCAC is replacing its proposal with a new proposal that compliments the zEPI path: the proposal allows compliance with either zEPI model or an IECC-based energy model. This proposal will not modify or remove the zEPI path, which shall remain as Section 602.

Addresses concerns of committee on:

- Units of energy: energy use is in kBtu, not kBtu/SF-yr.
- Does not delete zEPI. The proposal provides an alternate path that compares the design building to the current IECC. Provides a path where the designer and code official can see relative improvement over current I-code energy requirements. Use of the zEPI path is still available to designers who wish to utilize this path.
- Cleans the methodology for energy modeling, energy conversion factors and emissions factor application to mirror the clean-up of GEW-24. This provides a clearer, easier to understand compliance methodology which meets the intent our original proposal: In the 2012 IgCC, Section 602 and the Jurisdictional Requirements under Section 302 were confusing and difficult to understand. Many jurisdictions were not adopting Chapter 6 of the IgCC for these reasons. GEW-76 provides a clear, understandable alternate path.
- In addition, GEW-76, as modified by public comment, provides an alternate compliance path for building types that are not covered under GEW-24. Designers and building owners more familiar with compliance to the IECC can understand and utilize this alternate method to Section 602.

The revised proposal accomplishes its goal through the following:

1. It modifies Section 601.3.1 to allow the energy modeled performance path under either Section 602 (the zEPI path) or new Section 603 (IECC-based performance path). This update allows the compliance under zEPI, which compares to ASHRAE 90.1, or under the IECC-based modeling path.
2. New section 603, performance-based IECC path is a stand-alone energy performance modeling path. The proposed building and baseline buildings are modeled to the IECC Section C407. The proposed design must be 15% better than the baseline IECC building energy use. This mirrors the equivalent energy improvement goal of the zEPI path. The local jurisdiction may set alternate energy improvement goals under Section 302.1 and Table 302.1 when the jurisdiction seeks better energy performance.
3. Energy and CO2e conversion tables and methodologies match the updates, reorganization and clarifications included in GEW-24. There is no substantive revision to the conversion requirements required for zEPI, maintain and equivalent.
4. GEW-76 improves upon the zEPI clarifications submitted under GEW-24 by addressing issues with Section 302, including the exception for buildings under 25,000 square feet and the jurisdictional requirements.

This proposal requires equivalent energy savings to the zEPI-path. If the zEPI goal is updated in future code cycles, as noted in the proposed path to net-zero energy use reason statement for zEPI modifications, the IECC-based compliance path can be updated as well. The intent is for the IECC-based alternate path to remain equivalent to the zEPI compliance path.

The SEHPCAC asks that the membership overturn the committee decision so that this alternate path may be considered. Designers to the IgCC have asked for and need an alternate performance path to the IgCC.

GG76-14

GG77-14

302.1, 408.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Choice is a good thing in this situation. This is a good pointer to discuss the code locally. It is important to have a choice in a jurisdiction to opt in or opt out.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Jay Crandell, ARES Consulting, representing EPDM Roofing Association (jcrandell@aresconsulting.biz) requests, Approve as Submitted.

Commenter's Reason: This proposal was approved as submitted at the first hearing for reason of giving needed flexibility to local jurisdictions in considering and making decisions about appropriate use of green roofing requirements that vary in efficacy and need depending on local conditions and building population density, among other things. Consequently, this proposal will make the IgCC more adoptable. The ICC membership is urged to sustain the committee's action to approve as submitted or to support a separate PC by this proponent that strives to achieve the same flexibility and also better coordinate with provisions in the base codes (IECC and IBC).

Public Comment 2:

Jay Crandell, ARES Consulting, representing EPDM Roofing Association (jcrandell@aresconsulting.biz) requests Approve as Modified by this Public Comment.

Modify the proposal 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	Yes	No
402.2.2	Flood hazard area preservation, specific	Yes	No
402.3	Surface water protection	Yes	No
402.5	Conservation area	Yes	No
402.7	Agricultural land	Yes	No
402.8	Greenfield sites	Yes	No
407.4.1	High-occupancy vehicle parking	Yes	No
407.4.2	Low-emission, hybrid and electric vehicle parking	Yes	No
408.3	Roof coverings — solar reflectance and thermal emittance	Yes	No
409.1	Light pollution control	Yes	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 C402.3 of the *International Energy Conservation Code* including the listed exceptions; shall be covered with a vegetative roof complying with Section 408.3.2 408.3.1 and Section 1507.16 of the *International Building Code*; 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.

Exceptions: 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.

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.

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.

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**

408.3.2 408.3.1 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.

Commenter's Reason: The GG77 proposal's concept of implementing green roofs (cool or vegetative) as a jurisdictional option was approved as submitted at the first hearing for reason of the needed flexibility. While the GG77 proposal remains a valid solution and is supported by this proponent, this public comment is offered as an alternative approach that may better coordinate requirements with those in the IECC base code while also providing the following additional benefits:

1. The IgCC is an overlay code and most of the content in Section 408.3 dealing with cool roofs is already addressed in the IECC. Thus, this PC simply makes reference to those requirements in the base code (which includes a more complete list of exceptions) and removes redundant requirements from the IgCC. This will simplify code understanding and enforcement and improve coordination of the I-Codes through an appropriate "overlay" framework for Section 408.3.
2. The 2015 IBC Section 1507.16 has introduced new requirements for vegetative roofs and a reference to these requirements should be included in the 2015 IgCC. The additional requirements for vegetative roofs in the IgCC remain unchanged (only a change to the section numbering).

Similar to the original GG77 proposal approved "as submitted", this modification will also help to improve adoptability and enforceability of the IgCC. The ICC membership is encouraged to vote in support of either (1) GG77 approved as submitted or (2) GG77 as modified by this public comment. Both offer the flexibility to rely on the IECC base code requirements, although by different means.

Public Comment 3:

Amy Dickie, representing Global Cool Cities Alliance requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

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.

Commenter's Reason: GG77 makes the solar reflectance and thermal emittance requirements for roof coverings into a jurisdictional elective. Because GG77 would no longer mandate cool roofs as part of the IgCC unless doing so makes sense for the climate and building stock of a particular jurisdiction that elects to do so, there is no longer a reason to specify climate zones.

Table 302.1 does provide flexibility for jurisdictions to select measures appropriate for their communities. No other provision in Table 302.1 limits communities located in a particular climate zone, or subject to any geographic criteria, from selecting provisions in the Table. In fact, the Commentary to 2012 IgCC states:

"Table 302.1....facilitates customization by jurisdictions so that their specific geographical and political priorities related to sustainability may be addressed including..... heat island effect."

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302.1, 605.1.1

Proposed Change as Submitted

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 CO ₂ e 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

Public Hearing Results

Committee Action:

Disapproved

This code change proposal was heard by the IgCC Energy/Water Committee.

Committee Reason: The committee felt that the code should state an overall minimum for increasing envelope stringency. Turning this provision into a jurisdiction option loses this minimum as a part of clear statement that the IgCC should be an improvement over the IECC. By transferring the decision to the jurisdiction on this issue, sends the wrong message on this core component of the IgCC. If jurisdictions are unhappy with the envelope provisions, they can amend them out, and such probably easier than adding them into their code.

Assembly Motion:

None

Online Vote Results:

Failed - Support: 42.35% (72) Oppose: 57.65% (98)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org) requests, Approve as Submitted.

Commenter's Reason: The International Energy Conservation Code has made significant strides but remains controversial in the envelope provisions. It's reasonable to permit jurisdictions to remove the increased envelope provisions and more readily take advantage of the other important parts of the IgCC. Incremental increases which result in greater cost should be given every possible opportunity for jurisdictional input and public debate.

Public Comment 2:

Greg Johnson, Johnson & Associates Consulting Services, representing The Coalition for Fair Energy Codes (gjohnsonconsulting@gmail.com); Mark Nowak (mark@mnowak.net); Shirley Ellis (shirleyellis@tamu.edu); Thomas Culp, Birch Point Consulting, representing self (culp@birchpointconsulting.com); Martha VanGeem, self, representing the Portland Cement Association and the Masonry Alliance for Codes and Standards, representing self; Stephen Kanipe (Stephen.kanipe@cityofaspen.com); Hope Medina, Cherry Hills Village, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net) requests Approve as Submitted.

Commenter's Reason: The automatic 10% increase in envelope stringency in Sec. 605.1.1 is a barrier to the adoption of broader and more significant green building provisions. Public resistance to the ever increasing stringency of the IECC envelope provisions is well documented via lagging adoptions and relaxed envelope stringency amendments.

In the committee discussion it was said that it should be difficult for a jurisdiction to amend the IgCC's envelope provisions which reflects an incomplete understanding of the relationship of a code to a community.

The code exists to serve the community; the community does not exist to serve the code.

If the community is better served by adopting the thermal envelope increase it only takes a simple checkmark to make the IgCC better serve that community under this proposal.

Where not selecting the increased envelope stringency provisions makes it easier to adopt the other provisions of the IgCC the community will still be better served by the code and other advances in green building will occur.

The idea that a community has to adopt every provision of the code or it loses its 'green' credibility is without merit. People should not be afraid of asking a community to be involved in deciding what will have the best green impact in that community.

Public Comment 3:

Emily Lorenz , representing self (emilyblorenz@gmail.com) requests Approve as Submitted.

Commenter's Reason: This code change proposal should be approved as submitted because the code language, as written, is not beneficial to all climate zones. Designers should not be tied to a mandatory prescriptive criterion for every climate zone that does not save energy in every climate zone. There are many ways to reduce the energy consumption in a building. But requiring a 10% increase in prescriptive envelope factors may work against other, more-sophisticated strategies being attempted by designers. In warmer climates especially, a 10% increase in insulation values may not increase energy savings enough to be cost-effective, and it also creates greater environmental impacts due to the increased use of insulation materials. Please approve this code change as submitted to ensure flexibility and ingenuity in the application of the code.

Public Comment 4:

Martha VanGeem, self, representing the Portland Cement Association and the Masonry Alliance for Codes and Standards requests Approve as Submitted.

Commenter's Reason: The 10% factor results in an uneven standard with little to no energy savings in the warmest climate zones. Conversely, it will result in less efficient designs when the SHGCs are reduced in cold climates. Further, it is an arbitrary requirement that is not cost-effective since it goes beyond base code values that have been optimized for life cycle costs. We have basically exhausted the opportunities in the opaque envelope for more efficiency. For the few areas that are exceptions, placing the 10% requirement in an appendix will allow those jurisdictions to examine the opportunities and make an informed decision to adopt more stringent requirements based on the local climate and other conditions.

GG78-14

GG79-14

202 (New), 302.1, 407.4.3 (New)

Proposed Change as Submitted

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 ALTERNATIVE FUEL 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Does 2 vehicles mean 1 space and they drive in and out? Does it mean 2 parking spaces? The proposal is not clear. This should be the choice of the building owner and should not become mandated in the body of the code when a jurisdiction selects the option in Table 302.1.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Wayne Stoppelmoor, representing Schneider Electric (wayne.stoppelmoor@schneider-electric.com) requests Approve as Submitted.

Commenter's Reason: The committee disapproved this proposal stating "this should be the choice of the building owner and should not become mandated in the body of the code." It is respectfully submitted that this requirement is not a mandate and is very flexible by making it a jurisdictional option. The proposal is flexible as it allows all types of alternative fuel vehicle refueling or recharging stations to comply. In regards to serving two vehicles, it is up to the building owner to provide one refueling / recharging station that has two fuel dispensers / connectors, or to provide two refueling / recharging stations. Either would be acceptable under this proposal. Therefore it is respectfully submitted that this proposal should be approved as submitted.

Public Comment 2:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 ~~40,000~~ 25,000 square feet (929 2,322 m²) 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.

Commenter's Reason: This public comment would raise the minimum building size subject to section from 10,000 sqft as proposed to 25,000.

It will add only a de minimis amount of cost to buildings that voluntarily choose to build to the IGCC requirements.

Failure to address alternative transportation in the IGCC is a glaring deficiency and this proposal as modified by this public comment would remedy that deficiency at a relatively low price.

Public Comment 3:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 m²) 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~~ one alternative fuel vehicles vehicle shall be installed.

Commenter's Reason: This modification will simplify and clarify the requirement to address the committee's concerns. In addition, this modified proposal is much more flexible than the requirements written in other green building programs and standards.

GG79-14

GG84-14

303.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proponent requested disapproval because the proponent's GG85-14 proposal, which addressed the same subject, was approved.

Assembly Action:

None

Analysis: For staff analysis of the content of ASTM E2921-13 with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit:

<http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) (SEHPCAC@iccsafe.org) requests Approve as Submitted.

Commenter's Reason: See the SEHPCAC's original published reason statement. The SEHPCAC plans to move this proposal only in the event that the SEHPCAC's G85-14 proposal is disapproved at the Final Action Hearings.

This comment 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>.

GG84-14

GG85-14

303.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal simplifies and clarifies whole building life cycle assessment. The proposed standard is a well-established approach that will give designers options. The proposal allows the code to mature and develop.

Assembly Action:

None

Analysis: For staff analysis of the content of ASTM E2921-13 with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit:
<http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment 1:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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.
 - 1.6. Resource use, elements and fossil.
 - 1.7. Land use, including habitat alteration.
2. The life cycle assessment tool shall be approved by the code official.
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.
4. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.

Commenter's 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.

Public Comment 2:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 life cycle assessment tool shall be approved by the code official~~

- 3. ~~2.~~ 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.
- 4. ~~3.~~ For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.

Commenter's Reason: 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.

Further, this emphasis appears to be used liberally in the IgCC whereby the phrase "approved by the code official" can be found in the following locations. This is only for "approved by the code official" only, and not other approval notices for which there are liberal applications of same.

302 LCA
404.2 Outdoor ornamental fountains
405.1.4.2 (2.2) Restoration of soils
406 Diverted materials
610.1 Renewable energy systems
611.3.1 Preconstruction documentation lighting
611.4.1 Preconstruction documentation building thermal envelope
708.12.1 Gray water sources
903.1 commissioning
1007.2.2 specific exclusions existing buildings

Public Comment 3:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Disapprove.

Commenter's Reason: This proposal is too simplistic. We would point out that the ASTM "whole building" versus "reference" building design building analysis application is vague. This simplicity and vagueness allows for multiple interpretations by the users, which if that is the case will require the code official to ultimately officiate the scope and application to maintain order and consistency. This is contrary to the methodology contained in IECC or Standard 90.1 performance modeling provisions which have been employed for over a decade where descriptors for a base and proposed building are articulated.

We must also realize that when incorporating ASTM E2921 that the user must agree to the following stipulation of the standard which reads:

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 or permitting stage, or both where this practice applies."

By requiring this it effectively prevents the majority of buildings from complying at the very start. Why? Because in today's market there are two basic building types; owner occupied and investor owned. Investor owned type buildings currently dominate the market in the US (Source: BOMA). That being the case, and since investor owned buildings are designed to be flexible in design, this places those owners at a disadvantage since they would not be able to comply with ASTM E2921 Section 1.3 because they make changes to their buildings functions to accommodate their tenants.

Also, if we examine Subpart #5 "process loads" are not appropriate to delete since ASTM E2921 specifically relies on the code to specify. For example in ASTM E2921, Section 6.2.2, states "The operations stage shall include **operating energy use** if required or explicitly allowed by the applicable code or rating system, in which case the results of energy simulations for the reference and final building designs shall be included in the LCAs and combined with embodied effects for the purpose of calculating impact measures...."

In view of the above we recommend disapproval.

GG85-14

GG86-14

303.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This document needs to set a bar. The 60 year service life bar is important. Higher service life years can still be used.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Martha VanGeem, representing the Portland Cement Association and the Masonry Alliance for Codes and Standards; Emily Lorenz, representing Precast, Prestressed Concrete Institute (emilyblorenz@gmail.com) requests Disapprove.

Commenter's Reason: We ask for disapproval. "...the building service life shall be no less than 75 years" is stated in ASTM E2921-13, section 6.1.1. ASTM E2921-13 is a consensus standard document within ASTM committee E60 on sustainability. ASTM E2921-13, "Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems," has been accepted as the baseline for this section according to committee action on proposal GG 85 during the spring hearings. ASTM E2921-13 was developed by ASTM Committee E60, which has over 700 voting members; was chaired by an industry expert; and went through a consensus process that lasted over 4 years. This consensus process, which underwent several public reviews and received input from many of the industry's experts, resulted in a service life of 75 years. There is no valid reason to lower this to 60 years when the 75 years has been through an extensive ASTM/ANSI standard process.

ASTM E2921-13 has established a precedence for service life for LCA. Changing the service life, yet still allowing the use of ASTM E2921-13, may result in LCA reports that are submitted to the code official with different service lives. This may create an annoyance for the code officials.

In addition, the U.S. Department of energy lists the median life for large commercial buildings to be 73 years.

Because many experts agree on the 75-year service life, please disapprove this proposal and leave the service life of 75 years as listed in ASTM E2921.

GG86-14

GG87-14

303.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The ASHRAE 105 standard referenced is not useable as it is not current.

Assembly Action:

None

Analysis: For staff analysis of the content of ASHRAE 105 with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Mike Fischer, representing The Center for the Polyurethanes Industry and the Polyisocyanurate Insulation Manufacturers Association (mfischer@kellenccompany.com) requests Approve as Submitted.

Commenter's Reason:

Polyisocyanurate Insulation Manufacturers Association:

The Committee reason statement for disapproval stated that the standard was not current; it has been released with the 2014 version. Without the adoption of this standard by reference, the determination of building energy use is not properly defined within the IgCC. ASHRAE 105 was developed and is maintained through a consensus process where all affected and interested parties may participate. Concerns about the metrics contained within the standard were considered during that process; this is the best option available to ensure that users of the IgCC are operating under consistent rules.

Center for the Polyurethanes Industry:

With respect to whole building LCA, the code depends on the determination of building energy performance, but currently lacks guidance on how to measure the actual performance. We therefore support this proposal that fills in the gaps and ensures apples-to-apples energy use comparisons.

GG87-14

GG88-14

303.1, 303.1.1 (New), 303.1.1.1 (New), 303.1.2 (New), 303.1.2.1 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee prefers the life cycle assessment improvements in proposed code changes GG83-14 and GG85-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mike Fischer, representing The Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com) requests Approve as Submitted.

Commenter's Reason: The proposal makes no technical changes; it was disapproved based on committee recommendations on other proposals. This public comment is submitted as a placeholder in the event that other technical changes are not approved; it will add clarity to the code and provide an easier path to understanding the current requirements.

GG88-14

GG89-14

303.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There are many uncertainties introduced by this proposal. This does not improve the code. It may be cutting edge, but it is not useable. It is important to address land use, resource use and habitat alteration. However, based on the testimony, standardized tools to measure them are either not available or are not well established. When metrics are established, that would be the time to introduce such a proposal. This is not a requirement; it is an option to the materials section. If we make the option too difficult, it will never get used and will not move the bar for LCA forward.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Approve as Submitted.

Commenter's Reason: We ask for approval as submitted. We disagree with the committee's reasons for the following reasons:

- 1.) The request for these subjects has been presented to the IgCC for five (5) years, and the reason for not accepting remains the same, "that the tools to evaluate these subjects is not available." Doing nothing on a subject that is considered as important to LCA analysis is not reasonable.
- 2.) The IgCC has accepted other requirements even though the reference or data was not or not entirely available in other sections, therefore we should be consistent when applying code change proposals.
- 3.) As to use of the document, other sections contain difficult requirements but the membership accepted those requirements anyway...therefore difficulty should not be parsed out in a discriminating manner.

In view of the above we believe that the opinions which oppose the introduction do not warrant disapproval of this proposal.

GG89-14

GG90-14

303.1

Proposed Change as Submitted

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@steelframingassociation.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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Some assessment tools may be better than others or may be deficient. The code official needs to have the power to approve life cycle assessment tools.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Approve as Submitted.

Commenter's Reason: We disagree with the code development committee reason for disapproval. 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.

Further, this emphasis appears to be used liberally in the IgCC whereby the phrase "approved by the code official" can be found in the following locations. This is only for "approved by the code official" only, and not other approval notices for which there are liberal applications of same.

- 302 LCA
- 404.2 Outdoor ornamental fountains
- 405.1.4.2 (2.2) Restoration of soils
- 406 Diverted materials
- 610.1 Renewable energy systems
- 611.3.1 Preconstruction documentation lighting
- 611.4.1 Preconstruction documentation building thermal envelope
- 708.12.1 Gray water sources
- 903.1 Commissioning
- 1007.2.2 Specific exclusions existing buildings

GG90-14

GG92-14

303.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee disapproved this proposal in favor of GG85-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Approve as Submitted.

Commenter's Reason: We request approval as submitted. The committee merely disapproved this proposal as a result of their action on GG85-14, and not for a technical reason.

We are submitting a public comment to ensure that if GG85-14 is disapproved that this proposal can be a contender for the IgCC. The technical basis is shown in our original reason statement, which contains an excerpt from ISO 14044 provisions, is the basis for the modification.

GG92-14

GG95-14

303, 303.1, 505.1

Proposed Change as Submitted

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:

- ~~4. 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, September 2006.

Cost Impact: Will not increase the cost of construction.

GG95-14 : 303.1-NOWAK414

Public Hearing Results

Committee Action

Disapproved

Committee Reason: Life Cycle Assessment is the wave of the future.

Assembly Motion:

As Submitted

Online Vote Results:

Failed - Support: 40.76% (75) Oppose: 59.24% (109)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Craig Conner, representing self (craig.conner@mac.com); Hope Medina, Cherry Hills Village, representing Cherry Hills Village (hmedina@coloradocode.net) requests, Approve as Submitted.

Commenter's Reason: Section 303 describes a complex analysis. It requires a 20% improvement, but 20% compared to what? For example, what materials is the base case building made of?

Item #9 in Section 303 requires conformance with ISO 14044, but ISO 14044 states in its Section 1 (Scope) "This International Standard is not intended for contractual, or regulatory purposes ..." A building code is a regulation.

Public Comment 2:

Mark Nowak, representing Steel Framing Alliance requests Approve as Submitted.

Commenter's Reason: LCA is not an appropriate method for the IgCC or any building code for the following reasons:

1. **The ability of an LCA study to differentiate between different materials in a building that uses energy throughout its life is insignificant and falls outside normal ranges of statistical acceptability. 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 determining emissions, not the material selection.**

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 in a range of subjective impacts.

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 2006 Athena Institute study¹). Total error would be much greater. The outcomes are in the range of statistical noise when applied to building materials.

2. LCA has significant technical limitations that make it inappropriate for use in assessing a building design

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.

LCA relies on subjective scope, boundary decisions and value judgments. The results of an LCA are neither reproducible nor comparable to other LCAs.

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.

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, or products from manufacturers who are doing the same.

3. The use of LCA as currently included in the IgCC leaves open the opportunity to conduct LCA studies that are not in compliance with the ISO standards.

The ISO standards for LCA require the data to be representative for the materials or products being used. This data does not exist for most groups of products and instead, is being substituted with industry average data, in many cases on a continent-wide basis. 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.

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.

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 ever being informed of the potential negative impact of the decision.

It is not possible to use a life-cycle assessment "tool" as permitted in the current language 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.

4. LCA is not an equivalent "trade-off" to the prescriptive single attribute 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.

GG95-14

GG98-14

303.1

Proposed Change as Submitted

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.

Bibliography:

Rosenbaum, R.K., Bachmann, T.M., Gold, L.S., Huijbregts, M.A.J., Jolliet, O., Juraske, R., Koehler, A., Larsen, H.F., MacLeod, M., Margni, M.D., McKone, T.E., Payet, J., Schuhmacher, M., van de Meent, D., Hauschild, M.Z., 2008. USEtox - The UNEP-SETAC toxicity model: Recommended characterization factors for human toxicity and freshwater ecotoxicity in life cycle impact assessment. The International Journal of Life Cycle Assessment 13, 532-546.

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The EPA is better suited to determine what toxicity is and to regulate what types of compounds building materials are composed of. Going from 2 to 3 required selections may present difficulties and the reason statement does not qualify the need for this.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Martha VanGeem, representing self; Emily Lorenz, representing self (emilyblorenz@gmail.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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.
- 2 through 9 (*No changes to text*)

Commenter's Reason: This section has been modified to change the number of impacts required to show improvement from three back to TWO as it is in IgCC-2012. Specifically, the number impacts required to show 20% improvement, in addition to global warming potential, has been changed back to TWO based on public testimony and committee comments.

This section is not related to environmental product declarations (EPDs). It is related to life-cycle assessments (LCAs) (ISO 14044), in which ecotoxicity is a valid impact measure. Ecotoxicity is a valid impact measure in both ISO 14044 and ASTM E2921 on LCA. Results will not be inconsistent if this impact measure is added because this section requires that the same LCA software tool be used for both the reference and project buildings.

The EPA does not determine impact measures for ISO 14044. Nevertheless, EPA's Tool for the Assessment of Chemical and Other Environmental Impacts (TRACI) includes ecotoxicity. Ecotoxicity is included in TRACI v2.1, the latest version. <http://www.epa.gov/nrmrl/std/traci/traci.html>

GG98-14

GG102-14

401.2, 405.1.1

Proposed Change as Submitted

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:
 - 1.1 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, 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.

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: In the committee's experience, even in communities that go back to the pilgrims, there is not a problem going back and figuring what has been altered. While the committee understands the proponent's concerns regarding the "previous use and development" language in Item 2, the prior portions of Item 2 should remain as part of the inventory necessary to evaluate native soils and hydrological conditions. In fact, the committee feels that the current language may not go far enough.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Greg Johnson, Johnson & Associates Consulting Services, representing self (gjohnsonconsulting@gmail.com) requests Approve as Submitted.

Commenter's Reason: Regarding the code requirement for a determination of whether, and to what degree, the native soils and hydrological conditions of the building site have been disturbed and altered by previous use or development, the committee said, that in its experience, "even in communities that go back to the pilgrims, there is not a problem going back and figuring what has been altered."

The committee missed the point.

There is no provision of the code that requires the designer to have and use the information that is being required to be provided.

There is no provision of the code that requires the code official to have and use the information that is being required to be provided.

There is no provision of the code that requires the owner to have and use the information that is being required to be provided.

There is no provision of the code that requires local, state, Federal, foreign, or cosmic governments to have and use the information that is being required to be provided.

If nobody needs to have it, and nobody needs to use it, why should the code require everybody to provide it?

Public Comment 2:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Modified by this Public Comment.

Replace the proposal as follows:

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:
 - 1.1 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~~ 1.5 Locations for all laydown and storage areas, parking areas, haul roads and construction vehicle access, temporary utilities and construction trailer locations.
 - ~~1.7~~ 1.6 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~~ 1.7 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, 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.

Commenter's Reason: The committee had issues with the proposals changes to Section 401.2. The public comment deletes those changes and limits the application of the proposal to Section 405.1.1. Item 5 of Sec. 405.1.1 is effectively redundant with Item 4 and should be stricken.

This comment 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>.

GG102-14

GG103-14

202, 401.2, 405.1.1, 405.2.2

Proposed Change as Submitted

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:
 - 1.1. 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, 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.
 - 3.6. 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 unaddressed. 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There are good items in this proposal, but there are numerous problems with the definition for "site disturbance" and there are better definitions in other proposals. Definitions are key in the application of this code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

SITE DISTURBANCE. Areas Alterations of the building site that are altered, or have been altered, for site preparation or construction that affect the soils or vegetation of the site or include the removal or replacement of areas of hardscape.

Commenter's Reason: This public comment restores much of the original definition for "site disturbance," because the change to the definition was the only portion of the proposal that the committee objected to. This public comment also addresses hardscape in the definition, which is a critical element that was missing in the definition.

The remainder of the original proposal remains unchanged. See the reason provided for the original proposal for additional details.

This comment 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>.

GG103-14

GG104-14

202, 302.1, 402.3 (New)

Proposed Change as Submitted

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 comply	<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 4. SITE DEVELOPMENT AND LAND U			
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 structures</u>	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<u>402.3</u> <u>402.4</u>	Surface water protection	<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>402.8</u>	Agricultural land	<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	50% 65% 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 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 ^{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

Public Hearing Results

The following is errata that was posted on the ICC website:

**TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION**

402.3	Protection of high-risk buildings and structures	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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(This errata has already been incorporated into cdpACCESS)

Committee Action:

Disapproved

Committee Reason: The hazard categories in the International Building Code require buildings to be constructed to a higher standard, which already address some of these issues. The proposed title is misleading. It is not "protection," it is "prevention" of high risk buildings. According to this proposal, if you are building a fire station, you cannot build it in a 500 year flood plain. In other codes, there are special means or specific more restrictive measures that must be taken when constructing buildings in high risk areas. There will be communities that need to have such buildings in 500 year flood plains. Telling these communities that they cannot have these types of buildings in 500 year flood plains is too restrictive.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Susan Gitlin, US Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov) request Approve as Submitted.

Commenter's Reason: This proposal offers a very important option to those communities that are located in areas with an increasing potential for flooding. Such communities may have decided to take steps to maximize the safety of their residents and ensure the continuance of essential operations during emergencies. This language is offered an option for them such that they can provide such protections.

Public Comment 2:

**Scott Fraser, City of Key West, Florida, representing City of Key West, Florida
(sfraser@keywestcity.com) request Disapprove.**

Commenter's Reason: This proposal would seem to prohibit critical facilities from being located anywhere within our entire city, and the county.

Our city's highest elevation is approximately 16' +msl, which constitutes most of our 500-year floodplain; yet that area represents only about 10% of our city's total area. Every other location within our community is below the 500-year floodplain.

Therefore, not only couldn't we have neighborhood police, fire, ems, medical facilities, the nearest such facilities would need to be on the mainland some 160 miles away, subject to 42 bridges along a single land access route

GG104-14

GG105-14

302.1, 402.2., 402.2.3 (NEW), 402.2.3

Proposed Change as Submitted

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. 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	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 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>402.2.3</u>	<u>Flood hazard area preservation, limitation on fill</u>	<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
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 ₂ e 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
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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

Public Hearing Results

The following is errata that was posted on the ICC website:

TABLE 302.1
REQUIREMENTS DETERMINED BY THE JURISDICTION

402.2.3	Flood hazard area preservation, limitation on fill	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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(Portions of proposal not shown remain unchanged)

(This errata has already been incorporated into cdpACCESS)

Committee Action

As Submitted

Committee Reason: This is a design and resiliency issue, not a structural issue, and belongs in the IgCC.

Assembly Motion:

Disapproved

Online Vote Results:

Successful - Support: 50.29% (86) Oppose: 49.71% (85)

Assembly Action:

Disapproved

Individual Consideration Agenda

Public Comment 1:

Jonathan Siu, representing Washington Association of Building Officials Technical Code Development Committee (jon.siu@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

402.2.3 Flood hazard area preservation, limitation on fill. Where this section is indicated to be applicable in Table 302.1, fill shall not be used added to support ~~slab-on-grade~~ foundations for new buildings and structures and substantial improvements.

Commenter's Reason: The proposal as submitted has two significant flaws. It does not take into account that fill may exist on site, and it unnecessarily restricts the prohibition of fill to only slab-on-grade foundations.

In many jurisdictions, fill was placed on sites many decades ago. In some cases, the only reason the sites exist is because fill was placed there (think of "reclaimed land" in San Francisco Bay, or in Elliott Bay in Seattle). It is unnecessarily restrictive to prohibit supporting a structure on that existing fill. Many buildings are safely supported on existing fill by a structural "mat," or by piles utilizing "skin friction" to support the structure.

"Slab-on-grade" is deleted because the impacts of supporting any type of foundation, such as one constructed with a footing and stem wall on fill are the same as supporting a slab on grade foundation. If it is undesirable for one, it is undesirable for both. Note that this should not affect pile or pier foundations since fill is not added to support these types of foundations.

Public Comment 2:

Assembly Action requests Disapprove.

Commenter's Reason: This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action. The assembly action for Disapprove was successful by a vote of 50.29% (86) to 49.71% (85) by eligible members online during the period to May 19 - May 30, 2014.

Public Comment 3:

Gary Ehrlich, National Association of Home Builders, representing National Association of Home Builders (gehrlich@nabh.org) request Disapprove.

Commenter's Reason: The purpose of this public comment is to urge overturning of the committee action of As Submitted and to support the floor action of Disapproval.

Buildings required to be constructed to the provisions of the IgCC are governed by the International Building Code. Section 1612 of the IBC on Flood-Resistant Construction requires the use of ASCE 24 Flood Resistant Design and Construction as the reference standard for flood-resistant construction. ASCE 24 contains specific requirements for placement and compaction of fill used on sites in Zone A, and for protection of fill against erosion. In fact, ASCE 24 exceeds the minimum NFIP requirements in many respects, including the use of fill.

ASCE 24 and the IBC allow construction of backfilled stem wall foundations in both Zone A and the Coastal A Zone. This system, which consists of a slab-on-grade bearing on engineered fill contained within a concrete or masonry stem wall, is recognized as providing significantly increased flood resistance to that of an ordinary stem or foundation wall enclosing a basement or crawlspace. Unfortunately, as written, the proposed requirement does not differentiate between fill used to raise the grade over a larger portion of a site and the fill that would be used behind a backfilled stem wall, and thus could be interpreted as prohibiting this type of foundation wall.

The proponents cite wetland protection, loss of mature trees and drainage to adjacent properties as justification, but the IgCC already contains mandatory provisions to address these issues. These provisions include avoidance of and required buffers around wetlands, protection of existing trees and vegetation on the site, and on-site impoundment of stormwater and the use of low-impact development techniques to minimize runoff onto adjacent properties.

The proponents have not provided detailed justification for its claim the cost of construction will not increase (or in fact will decrease). In fact, in some areas costs could increase if concrete and masonry material and labor costs exceed those to provide fill.

The committee reason does not make sense. Fill used to support a building, whether simply used to support a footing or to raise the lowest floor elevation of the building, must be of particular soil types considered good for structural bearing and be compacted as directed by the registered design professional in responsible charge for the structural design. The soil properties, including the degree of compaction, must be verified by a geotechnical engineer during the construction process. This is part and parcel of the structural design and falls completely and properly within the IBC scope. It should not be separately regulated by the IgCC.

Please vote to overturn the committee action of As Submitted and in favor of Disapproval.

GG105-14

GG106-14

202, 402.2.3

Proposed Change as Submitted

Proponent: John McShane, US Environmental Protection Agency; Alan Luloff, Association of State Flood Plain Managers

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 (Luloff, 2013).

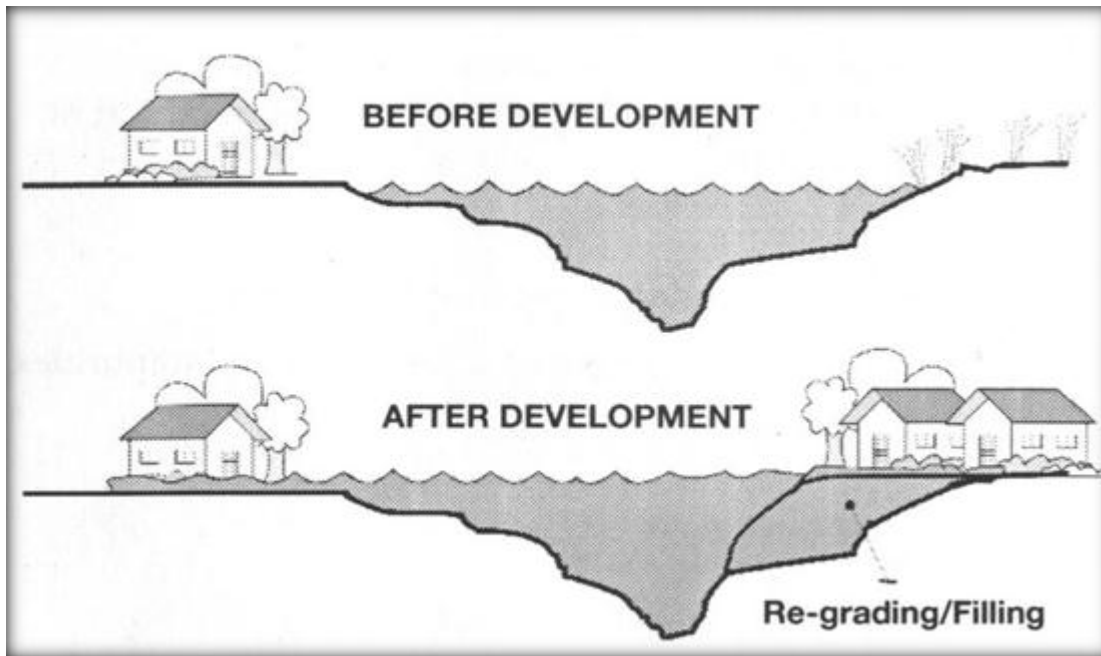


Figure 1- impact of encroachments into riverine flood hazard areas

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This requires an engineer to be hired to perform analysis even for a small addition in the hydraulic shadow of a larger structure or for a substantial improvement that does not change the footprint of a structure. A perceived flaw in the National Flood Insurance Program and flood regulations should not be fixed by inserting language in the International Green Building Code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Alan Lulloff, Association of State Floodplain Managers, representing Association of State Floodplain Managers (alan@floods.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 or~~ 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.

Commenter's Reason: New development should not be allowed to increase flood damages on existing development or put emergency responders at risk that will inevitably be called upon to rescue people in structures constructed in a flood hazard area. The proposal was shortened to make it more understandable and less prescriptive. It no longer includes a requirement that all proposals must be submitted by an engineer so that a building official has discretion.

This proposal is not intended to fix a flaw in FEMA regulations since FEMA regulations specifically allow communities to adopt higher standards and provides incentives for communities to do so via their community rating system. Residents in communities that qualify for FEMA's community rating system get reduced flood insurance premiums.

GG106-14

GG107-14

402.3

Proposed Change as Submitted

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~~buffer shall be not less than the minimum ~~buffer~~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</u> <u>(Acres)</u>	<u>Stream or river width</u> <u>(Feet)</u>	<u>Minimum buffer width</u> <u>(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% or 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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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.

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Cost Impact: Will not increase the cost of construction.

GG107-14: 402.3-GITLIN842

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This topic is a city ordinance issue. There are too many variables that cannot be covered by a code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Susan Gitlin, US Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov) request Approve as Submitted.

Commenter's Reason: This table provides support for an optional jurisdictional requirement. For those jurisdictions that choose to protect their surface waters as described in Section 402.3, this table provides a useful and streamlined consolidation of the buffer distances shown by scientific studies and existing ordinances to be practical and protective.

GG107-14

GG108-14

402.3, 402.4

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: If there are problems, they should be fixed rather than deleting this section. Jurisdictions should be allowed to set buffer sizes. This section is important and needs to remain part of the code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) and David Collins, representing The American Institute of Architects (dcollins@preview-group.com) requests Approve as Submitted.

Commenter's Reason: The committee said that Section 402.3, which GG108 proposes to delete, should be fixed, not deleted. However, the committee also disapproved the fix, which was the buffer sizes that the GG109 proposal provided.

The SEHPCAC believes that, If GG109 is *not* approved, GG108 should be approved because the existing code text is broken and is not enforceable without the fix that GG109 provides. To be clear, the SEHPCAC prefers that the GG109 proposal be approved.

This comment 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>.

GG108-14

GG109-14

402.4, Table 402.4(1) (New)

Proposed Change as Submitted

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.

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Semlitsch R.D. and J.R. Bodie. 2003. "Biological Criteria for Buffer Zones around Wetlands and Riparian Habitats for Amphibians and Reptiles." *Conservation Biology* 17(5): 1219-1228.

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Syversen, N. 2005. "Effect and Design of Buffer Zones in the Nordic Climate: The Influence of Width, Amount of Surface Runoff, Seasonal Variation and Vegetation Type on Retention Efficiency for Nutrient and Particle Runoff." *Ecological Engineering* 24:483-490.

Wenger, S. 1999. *A Review of the Scientific Literature on Riparian Buffer Width, Extent, and Vegetation*. Available at www.rivercenter.uqa.edu/service/tools/buffers/buffer_lit_review.pdf.

Cost Impact: Will not increase the cost of construction

GG109-14: 402.4-GITLIN845

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This topic is a city ordinance issue. There are too many variables that cannot be covered by a code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Susan Gitlin, US Environmental Protection Agency, representing US Environmental Protection Agency (gitlin.susan@epa.gov) request Approve as Submitted.

Commenter's Reason: Section 402.4 requires that wetlands be protected AND that a buffer around wetlands be protected. No distances for those buffers are provided. This proposal corrects this gap by providing a useful and streamlined consolidation of the buffer distances shown in scientific studies and through existing ordinances to be practical and protective. The proposal also allows jurisdictions to set their own buffer distances.

Public Comment 2:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC); David Collins, representing The American Institute of Architects (dcollins@preview-group.com) request Approve as Modified by this Public Comment.

Modify the proposal as follows:

402.4 Wetland protection. Building and building site improvements shall not be located within a wetland or within a buffer 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-Exceptions:

1. 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.
2. Where there are existing and unique conditions of the wetland, habitat provided by the wetland or its buffer areas, existing buffers surrounding the wetland or existing development of the wetland or buffers, the jurisdiction shall have the authority to establish specific buffers widths different from Table 402.4 specific to a particular wetland.

Commenter's Reason: In GG108-14, the SEHPCAC proposed to eliminate the provisions for wetland protection because no guidance was provided for the setting of buffers. The IgCC General Code Development committee disapproved the proposal for the following reason:

Committee Reason: If there are problems, they should be fixed rather than deleting this section. Jurisdictions should be allowed to set buffer sizes. This section is important and needs to remain part of the code.

In GG109-14, the proponent tried to provide a framework for buffer sizes. The proposal included text that allowed jurisdictions to set their own. Again the committee disapproved the proposal for the following reasons:

Committee Reason: Although the Committee appreciates the attempt at providing guidance on this topic to the code official, this code is not the place for such guidance. Also, the minimum number of feet might conflict with what many jurisdictions have already established.

The SEHPCAC respectfully disagrees with the General Committee reasoning on these 2 proposals. If the committee feels that the wetland protection provisions are an important part of the code, it is then logical and necessary to provide guidance to local adopters. This will emphasize that wetland protection is an important element of a green construction code. If such guidance is important, that guidance can only be improved by providing a framework for minimum buffer sizes. If it is important to provide guidance on wetland protection, it is important enough to provide guidance on minimum buffers.

We recognize that wetlands vary widely across the U.S. and international locations that might adopt the IgCC. The minimums proposed in GG109 provide a starting point. This allows an adopting jurisdiction to use those provided in the table, or based on our proposed exception #2, to determine a specific buffer distance applicable to each unique wetland in the jurisdiction. The original GG109 proposal contained the phrase 'or otherwise established by the jurisdiction'. This proposal replaces and enhances the generic discretion for the jurisdiction with an exception that provides the jurisdiction additional guidance for establishing alternate buffer zones.

This comment was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC) and the American Institute of Architects. 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>.

Public Comment 3:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC); David Collins, representing The American Institute of Architects (dcollins@preview-group.com) request Approve as Modified by this Public Comment.

Modify the proposal as follows:

402.4 Wetland protection. Building and building site improvements shall not be located within a wetland or within a *buffer* 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***

Wetland area (Acres)	Slope of land surrounding the wetland	Minimum buffer width (Feet)
< 5	<u>Less than 10 percent</u>	50
	<u>Equal to or greater than 10 percent but less than 15 percent</u>	<u>60</u>
	<u>Equal to or greater than 15 percent but less than 20 percent</u>	<u>65</u>
	<u>Greater than 20 percent</u>	<u>80</u>
5 to 30	<u>Less than 10 percent</u>	75
	<u>Equal to or greater than 10 percent but less than 15 percent</u>	<u>85</u>
	<u>Equal to or greater than 15 percent but less than 20 percent</u>	<u>90</u>
	<u>Greater than 20 percent</u>	<u>105</u>
> 30	<u>Less than 10 percent</u>	100
	<u>Equal to or greater than 10 percent but less than 15 percent</u>	<u>110</u>
	<u>Equal to or greater than 15 percent but less than 20 percent</u>	<u>115</u>
	<u>Greater than 20 percent</u>	<u>130</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.

Commenter's Reason: The SEHPCAC had another proposal, GG108, that deleted Section 402.4, Wetland protection, because there was no criteria to enforce it (there were no buffer sizes). The IgCC General Committee disapproved that proposal because they said the existing section was important and, if broken should be fixed, not deleted. Yet the IgCC General Committee also disapproved GG109, which would have provided the criteria necessary (the buffer sizes) to fix the section. The SEHPCAC believes that the GG109 proposal is necessary, but should be improved and clarified by this public comment. The comment moves technical requirements from a footnote in Table 402.4(1) in the proposal into the body of the table. This is consistent with ICC formatting conventions and makes the technical information much more obvious to all users of the code.

Note that the other reason that the IgCC General Committee disapproved GG109 was because the minimum number of feet in the buffer sizes in the proposed table might conflict with what the jurisdiction has already established. However, the proposal already addressed this by the addition of the phrase "or otherwise established by the jurisdiction" to the end of the second sentence in Section 402.4. Note that the other SEHPCAC public comment to this proposal further clarifies this.

This comment was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC) and the American Institute of Architects. 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>.

GG109-14

GG113-14

402.8

Proposed Change as Submitted

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.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposed requirements should be left to the local jurisdiction. It is up to the county or city as to whether they would want to promote these types of arrangements at highway interchanges.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mark Nowak, representing Steel Framing Alliance (mark@mnowak.net) requests Approve as Modified by this Public Comment.

Modify the proposal 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 (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.
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 Existing educational and other campus settings.

Commenter's 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 likely 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 provides appropriate exceptions to permit more efficient development.

The modification in this public comment addresses an issue raised during the first hearings that the proposal was not clear that exception #6 should only apply to buildings on existing campus and educational settings. The text has been modified to clarify this point.

GG113-14

GG114-14

402.8

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Items 4.1 and 4.2 of Section 402.8 are dependent upon each other. Splitting them up does not meet the intent of this section.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approval as Modified by this Public Comment

Replace the proposal with the following:

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.

Commenter's Reason: Upon further review, the SEHPCAC agrees with the committee that much of the information that was proposed to be deleted in the original GG114 proposal is necessary for the use and enforcement of other portions of Section 402.4 Items 4 through 4.1.2. However, the SEHPCAC believes that the second sentence in Item 4 continues to be problematic as it is out of context and not related to the otherwise connectivity related concepts that are addressed in Items 4 through 4.2.3. Therefore, this public comment replaces the original proposal with a proposal that simply deletes the second sentence in Item 4, and does not make any other changes. This greatly clarifies the application of Item 4 and eliminates confusion.

This comment 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>.

GG114-14

GG116-14

403.1.1, 403.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The current language is more flexible and less restrictive and maintains 2 options. The proposal restricts it to just one option. It is going to cost something to prepare a report and that is not reflected in the cost statement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Modified by this Public Comment.

Modify the proposal 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 provided.

Commenter's Reason: The IgCC General committee disapproved the original GG116 proposal because they felt that it was more restrictive than the original language. The SEHPCAC respectfully disagrees. The proposed language simplifies, clarifies and offers greater flexibility. The committee also felt that the proposal would increase cost because it requires a hydrologic analysis. However, there was no way to comply with the requirements of section 403.1.1 without such an analysis. To be more specific, a) Item 1 to Section 403.1.1 requires that stormwater management systems retain not less than the volume of a single storm which is equal to the 95th percentile rainfall event, which cannot be calculated without a hydrologic analysis and b) Item 2 to Section 403.1.1 already requires hydrologic analysis in its second sentence.

This comment 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>.

GG116-14

GG120-14

404.1, 404.11

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The reason statement uses supporting information about water usage of single family homes but the IgCC does not cover single family homes. The established period of one year might not be appropriate for all circumstances.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Karen Hobbs, Natural Resources Defense Council, representing Natural Resources Defense Council (khobbs@nrdc.org) requests, Approve as Modified by this Public Comment.

Modify the proposal as follows:

404.1.1 Water for outdoor landscape irrigation. 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. o 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.

Commenter's Reason: The Committee voted to disapprove for the following reasons, "The reason statement uses supporting information about water usage of single family homes but the IgCC does not cover single family homes. The established period of one year might not be appropriate for all circumstances."

This revised reason statement addresses both of these issues:

1. The supporting information failed to provide data about water use and irrigation in buildings other than single family homes, simply noting that, "about half of the water used in a single-family American home during the course of a year will be for landscape irrigation." U.S. EPA's WaterSense estimates that, "Outdoor water use can account for between 5 and 30 percent of a facility's total water use..." Studies show that average landscape water use in the commercial and industrial sector can range from 7 percent of total water use for hospitals, 22 percent for office buildings, and up to 30 percent for schools. The California Water Plan found that "...water demand for landscape irrigation in residential, large landscapes, and CII [commercial, industrial and institutional] landscapes amounts to approximately 4 million acre feet, about 43% of urban demand."
2. The proposal submitted for public comment deletes the phrase, "not to exceed one year," for the time allowed to irrigate newly planted areas. While an establishment period of one year is typical for new landscapes, the Committee appropriately points out that for some geographic regions and for some landscape types, that period may be insufficient.

GG120-14

GG121-14

404.1.1, 404.1.1.1 (NEW)

Proposed Change as Submitted

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:

$$\text{MSB} = \frac{(\text{ED} - \text{P}) \times \text{PFT} \times 1.6 \times \text{ILA}}{\text{Equation 4-1}}$$

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The standard is not yet completed at this time. The formula in the proposal is not correct according to opposing testimony.

Assembly Action:

None

Analysis: For staff analysis of the content of ANSI/ASABE S623-XXXX relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Kent Sovocool, representing Alliance for Water Efficiency (kent.sovocool@snwa.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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:

$$MSB = (ED - P) \times PFT \times 4.6 \times 0.623 \times ILA$$

Equation 4-1

where:

MSB = The mid-summer baseline in gallons.

ED = The estimated peak demand month's average reference ~~evapotranspiration~~ evapotranspirational 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. ~~Where the most common turfgrass type is unknown the average of the values for cool and warm season turfgrasses shall be used. The plant factor shall be 0.8 for cool-season turf, 0.6 for warm-season turf, 0.7 where a combination of turfgrass types is used, and 0.7 where the turfgrass type is unknown.~~

ILA = The installed landscaped area in square feet assuming 100 percent coverage with turfgrass.

Commenter's Reason: The referenced standard has advanced considerably since the original introduction, but it is not yet complete. As such, the reference to it has been deleted and plant factors from the standard have been directly referenced by this public comment. With respect to the error, the opposition testimony noted a mathematical error in the formula for MSB calculation. This was a correct observation and this is now corrected with this modification. Lastly, a minor correction in this comment fixes the word "evapotranspirational" as the last letters was apparently lost in processing.

GG121-14

GG122-14

404.1.2

Proposed Change as Submitted

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:
 - 7.1. Have nozzles with matched precipitation rates.
 - 7.2. Be prohibited on landscape areas less than 4 feet (1230 mm) in any dimension.
 - 7.3. 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.

- 7.4. If of the pop-up configuration, pop-up to a height of not less than 4 inches (101 mm).
- 7.5. 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-MALOOLY1060

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee disapproved this proposal because it references a standard that is not yet published.

Assembly Action:

None

Analysis: For staff analysis of the content of ASABE/ICC 802-XXXX with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Kent Sovocool, representing Alliance for Water Efficiency (kent.sovocool@snwa.com) requests Approve as Submitted.

Bibliography: ASABE/ICC 802-2014

Commenter's Reason: The standard has now been fully completed, balloted and delivered to and approved by ANSI.

GG122-14

GG123-14

404.1.2

Proposed Change as Submitted

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 (~~12.7~~19.1 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 (~~170~~113.3 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 pop-up 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There are good things in this proposal, but the standard referenced is not yet complete. The committee recommended that the proponent make a public comment and come back in the Public Comment Hearings.

Assembly Action:

None

Analysis: For staff analysis of the content of ASABE/ICC 802 with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Brent Mecham, Irrigation Association, representing Irrigation Association (brentmecham@irrigation.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 appropriate for the emission devices, filters, and flush end assemblies.
6. Sprinklers shall:
 - 6.1 Comply with ASABE/ICC 802.
 - 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 0.65 inches (19.1 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 30 gallons (113.3 liters) per hour.

6.5 If of the pop-up configuration, shall have a pop-up height of not less than 4 inches (101 mm).

6.6 Only be installed in zones composed exclusively of sprinklers and 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.

Commenter's Reason: The proposed changes had many things that the committee liked, but the proposed standard that was submitted, ASABE/ICC 802-2014 had not yet been finalized and was the primary reason for rejection. The proposed standard has now been officially voted with unanimous consent and has been submitted to and approved by ANSI to become an American National Standard. A link to the standard is provided in the Bibliography section. Also the committee objected to the phrase "ground cover areas less than 12 inches tall at mature height" in Item 6.4, which has been deleted by this public comment.

GG123-14

GG126-14

404.1.2

Proposed Change as Submitted

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.

76. Automatic in-ground irrigation systems ~~Sprinklers~~ shall include the following:

~~6.1 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.~~

- ~~86.5. If of the pop-up configuration, pop-up to a height of not less than 4 inches (101mm).~~
~~96.6 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.
10. Low precipitation rate, high distribution uniformity rotary nozzles for spray heads.
 11. A mainline master valve or a combination of a master valve and pressure regulator.
 12. 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: "Watersense" should not be referenced in the code. Instead, the code should contain similar requirements. The proponents requested disapproval so that they may come back with improvements in the public comment period.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Kathleen Petrie, representing Regional Code Collaboration (kathleen.petrie@seattle.gov); Lee Kranz, City of Bellevue, WA, representing WABO (lkranz@bellevuewa.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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.
3. Systems shall not generate runoff or overspray.
4. Low-head drainage shall be prohibited.
- 3 5. 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 6. 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 7. All sprinklers and microirrigation Miroirrigation zones shall comply be equipped with pressure regulators in accordance with manufacturer's specifications for recommended operating pressure.
- 6 8. 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 9. Automatic in-ground irrigation systems sprinklers shall include the following: Drip, microirrigation and spray heads.

Exception: Where the application rate of the sprinklers is less than or equal to 0.5 inches (12.7mm) per hour.

- 9.1. All irrigation sprinklers within each irrigation zone shall have matched precipitation rates.
- 9.2. Irrigation sprinklers shall be prohibited on landscape areas less than 4 feet (1230 mm) in any dimension.
- 8-9.3. Sprinklers shall have a 1/4 of the pop-up configuration, pop-up to a height of not less than 4 inches (101 mm).
- 9-9.4. Sprinklers Sprinkler head spacing shall comply with manufacturer's specifications. be designed to achieve a lower quarter distribution uniformity of not less than 0.65.
10. Low precipitation rate, high distribution uniformity rotary nozzles for spray heads.
- 11-9.5. A mainline master valve or a combination of a master valve and pressure regulator. shall be installed when water for irrigating is municipally supplied.
12. Sprinkler heads with internal check valves.

Commenter's Reason: The proposed modifications to section 404.1.2 will clarify the intent of the section and ensure the requirements are applicable across all landscape types and do not just satisfy regional methods:

- New # 3 is important and should not be buried in item #2.
- New item #4 prohibits the leakage of water from sprinkler heads after the irrigation system has been turned off.
- With the addition of new items #3 & #4, smaller strips of landscaped areas can now be better designed to correct misdirected water flows.
- Modified item #7 broadens the requirement to include sprinklers. Pressure regulators have an operation range, however, now the focus is on achieving the correct operating pressure of the hardware.
- Item #9 changes the term to "irrigation sprinklers" in order to distinguish it from fire sprinklers.

- Using the term “irrigation sprinklers” broadens the type of hardware covered by item 9.1.
- Item #9.2 is a reinsertion of language from the 2012 IGCC.
- The deleted “Exception” was associated with item #6.3 (from the 2012 IGCC) which was proposed for deletion in the original code change proposal. Number 6.3 was deleted but the exception remained. This was a CDP submittal error that was not caught. It is appropriate for both #6.3 and its exception to be deleted because runoff is not determined by slope but by flow rate.
- Item #9.3 is modified for clarity.
- A lower quarter distribution uniformity of 0.65 applies to the largest turf area in the single family homes specification of the EPA WaterSense program, which is not the scope of the IGCC. The spacing of sprinkler heads based on project scope as guided by the manufacturer is a more accurate approach.
- Modified #9.5 clarifies that a mainline master valve should be installed for municipally supplied water only. This approach would not be appropriate for pump water systems.
- The deletion of item #4 is appropriate because the specified smart controllers utilize the precipitation rate to calculate appropriate run times and must comply with item 3 in the requirements. Plus, “high distribution uniformity” should be defined if used.
- Item #9.6 has been deleted because internal check valves are not appropriate for all landscapes.

GG126-14

GG129-14

202, 405.1.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Not all counties are covered by the USDA Natural Resources Conservation Service soil survey. This proposal takes choices away from jurisdictions. This language does not address international use of the IgCC. This proposal takes the determination of what is farmland away from local jurisdictions, which they are well able to deal with. The "appropriate state agency" language is questionable. If this proposal is brought back, when referencing a website, consider indicating "or other approved source."

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Modified by this Public Comment.

Modify the proposal 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 in accordance with the United States Department of Agriculture Natural Resources Conservation Service soil survey or other approved source.
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.

Commenter's Reason: In response to the IgCC General Committee's concerns, the USDA Natural Resources Conservation Service Soil Survey covers 95% of the counties in the US. Those that are not covered are remote and unsuitable for agriculture or silviculture which is why they have not been assessed.

Additionally, the proposal does not reference a website as the committee stated in the committee's reason for disapproval; it references a scientifically derived US Federal government soils assessment program and the resulting database or list that the program generates. This soils assessment program is where the unworkable (for code purposes) definitions of farmland originated. There is no other standard or program that identifies the farmlands regulated by this section.

The modification adding "or other approved source" allows for use of the IgCC in countries where the NRCS Soil Survey results are not applicable or in the 5% of counties that are not addressed by the Soil Survey database should agricultural and development use patterns change.

This comment 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>.

GG129-14

GG131-14

405.1.4.3 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The code should not reference a source such as the National Soil Conservation Surveys, and there is not a definition for undisturbed soils.

Assembly Action:

None

Analysis: For staff analysis of the content of ANSI Z60.1-2004 relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Submitted.

Commenter's Reason: This information is necessary to effectively enforce the IgCC.

The code should reference the USDA Natural Resources Conservation Service Soil Survey. It is a scientifically proven Federal government program (that has cost US taxpayers hundreds of millions of dollars) to develop a comprehensive understanding of the earth, literally, below our feet. As such, the committee's reason for not referencing it is unfounded and wasteful of resources.

In the IgCC General committee's reason for recommending disapproval of GG102, and in reference to soils previously disturbed by development or other use, the committee said, "In the committee's experience, even in communities that go back to the pilgrims, there is not a problem going back and figuring what has been altered." In other words, there should be no problem in figuring out what was disturbed and a definition of undisturbed is therefore moot.

The reference to undisturbed soils in item 2 is necessary for international use of the IgCC.

This comment 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>.

GG131-14

GG133-14

SECTION 202 (New), 405.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The Committee doesn't agree with reducing the amount of native vegetation from 75 percent to 25 percent. There needs to be a better term for Appropriate Plant Species that is more descriptive of native and non-native plant species. However, the introduction of the ANSI standard into the IgCC is good.

Assembly Action:

None

Analysis: For staff analysis of the content of ANSI Z60.1-2004 relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment 1:

Gerry Coons, Outdoor Power Equipment Institute, representing Outdoor Power Equipment Institute (gcoons@opei.org) requests Approve as Modified by this Public Comment.

Replace the proposal as follows:

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 10 percent of the newly landscaped area shall be planted with native plant species.

Commenter's Reason: A requirement for 10% native plants is consistent with requirements approved by the ASHRAE 189.1 committee. This percentage is more realistic in desert environments and urban locations where the native plant selections suitable for the specific location and purpose are limited. This also accommodates the reality of climate change; USDA plant hardiness climate zones have changed indicating that some native plants are less suitable for former locations than adapted plants. Reducing the required percentage will allow designers flexibility to meet site needs and to maximize biodiversity of the landscape.

Public Comment 2:

Greg Johnson, representing The Greenscape Alliance (gjohnsonconsulting@gmail.com) requests Approve as Modified by this Public Comment.

Replace the proposal as follows:

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 25 percent of the newly landscaped area shall be planted with native plant species.

Commenter's Reason: The requirement for 75% native plant landscaping is far too limiting for many areas of the country and particularly in heavily urbanized environments. Arguably, no plant species is native to an urban environment. Many plants (arbitrarily) identified as native to a local natural environment may not be adapted to a nearby urban ecosystem, while certain naturalized plant species may be better adapted and more capable of enhancing the functional human quality-of-life in urban areas. Rigid requirements for the use of native plants in an artificial non-native environment of urban structures, concrete, asphalt, and disturbed lands is not logical.

Joe Clancy, co-editor of the Landscape Architects Network, blogged on this topic saying, *"The use of exotics <non-natives> in stressful urban environments is itself more sustainable and more "green" than using a native planting scheme that would struggle to cope with the urban conditions. If a planting scheme thrives and fulfills its purpose, then what is the problem? Having a native planting scheme for the sake of it, in the wrong location, will lead to higher inputs and costs; defeating the sustainable goals of such schemes. It really does come back down to "right plant, right place", whether native or not.."*

Designers need flexibility to address the needs of sites that bear little relation to the natural environment in which the regionally native plants evolved. It is therefore unwise to promote regulations that mandate excessively stringent native plant installations in landscape plantings.

GG133-14

GG134-14

405.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Instead of deleting the text, the text should be fixed. This is an important item. Perhaps the 75 percent figure should be reduced. Adaptive plants should also be addressed. This section could be better, but omitting it would be a mistake. This section makes us aware that these concepts should be considered.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Modified by this Public Comment.

Replace the proposal as follows:

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 or adaptive plant species.

SECTION 202 DEFINITIONS

ADAPTIVE PLANT SPECIES. Plants that reliably grow well in a given habitat with minimal attention from humans in the form of winter protection, pest protection, water irrigation, or fertilization once root systems are established in the soil and that are not invasive.

Commenter's Reason: This proposal addresses the committee concerns that Section 405.3 should not be deleted and, instead, should also address adaptive plant species. As such, a definition for adaptive plant species is proposed and the term is also added to the existing text of Section 405.3.

The changes are needed because the existing language presents impossible hardships for many projects. For example, in many states, grasses are not native. Thus the application of this section would mean that golf courses in the State of Nevada could not utilize grass. The addition of "adaptive" plant species to the language, alone with the definition, makes this section useable.

Also see the proponent's (SEHPCAC's) original reason statement.

This comment 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>.

GG134-14

GG136-14

202 (New), 406.1, 406.2, 503.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal is too limiting for the disposal of site waste.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Steven Ferguson, ASHRAE, representing ASHRAE (sferguson@ashrae.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

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 or for waste-to-energy incineration 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.

Commenter's Reason: During the committee action hearings, it was pointed out that this proposal was inconsistent with Addendum to Standard 189.1 because materials processed for recycling that are used for waste-to-energy incineration would count for the calculation of diverted materials. That was the only issue raised during the committee action hearings, and this comment proposes to add that language.

Waste that is sent for energy recovery (or waste-to-energy) is not equivalent to recycling and therefore should not be considered equivalent to diverting materials from landfill via recycling. This is consistent with the EPA's waste management hierarchy, which places energy recovery as a "less preferred" option than Recycling. <http://www.epa.gov/wastes/nonhaz/municipal/hierarchy.htm>.

Public Comment 2:

Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov); Maureen Traxler, representing Washington Association of Building Officials Technical Code Development Committee (maureen.traxler@seattle.gov) request Approve as Modified by this Public Comment.

Modify the proposal as follows:

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.

Commenter's Reason: This public comment clarifies that any material used for alternative daily cover (ADC) in a landfill cannot be applied toward the 50% diversion requirement. If materials are processed for recycling by the receiving facility, then those materials should not be used as alternative daily cover. Any material used for ADC is not diverted from the landfill.

GG136-14

GG137-14

406.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The increase from 75 to 90 percent is very difficult. Removing wood, especially stumps from a site requires special permits in some cases. Contrary to the reason statement, there will be a cost increase if the materials cannot be reused on site.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov) requests, Approve as Modified by this Public Comment.

Modify the proposal as follows:

406.1 Building site waste management plan. A building site waste management plan shall be 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 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*~~ *To be considered diverted from the landfill, *invasive plant species* and contaminated soils shall be composted only in facilities that are licensed or permitted to handle the specific feedstock.*

Commenter's Reason: Directives for composting invasive species and contaminated soils have been relocated to a new item #8 because they should not be lumped in with the proof of submittal information of item #7.

The proven authorization of a facility being allowed to operate has been increased to both licensing and permitting since this proof varies nationally. Invasive species cannot be fully destroyed if they are not handled correctly.

Therefore, these materials should only be considered diverted if they have been taken to a facility that is specifically equipped to prepare the invasive plant material for compost.

There is some discomfort with increasing the diversion requirement to 90%, so this percentage has been returned back to the 75% requirement currently in the published 2012 IGCC, and will be addressed in a separate public comment.

Public Comment 2:

Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov) requests, Approve as Modified by this Public Comment.

Modify the proposal as follows:

406.1 Building site waste management plan. A building site waste management plan shall be submitted with the construction documents ~~developed~~ and implemented to divert not less than 90 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 the reuse, recycling and disposal of land-clearing debris and excavated clean soils ~~diversion~~ 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.*

Commenter's Reason: This public comment returns all original language back to the 2012 IGCC except to increase the diversion percentage for land-clearing debris from 75% to 90%. Other changes made by the original code proposal will be addressed in another public comment.

Composting reduces load on landfills, reduces greenhouse gasses and provides a premium form of soil and mulch. A study completed by San Francisco's Department of Environment shows that more than 1/3 of all waste entering landfills could be composted. Examples of cities that have already drastically limited or banned uncontaminated landclearing debris from the landfill are Sonoma County, CA; Montgomery County, MD; and Portland, OR. Projects in areas where receiving facilities are not close are likely managing the material on site with the help of stump grinding services. Projects in developed areas will continue to take the material to facilities that process landclearing debris.

GG137-14

GG138-14

406.2, 406.1, 503.1

Proposed Change as Submitted

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:

~~**406.1**~~ **503.1 Building site Waste management plan for land clearing debris and excavated soils.** 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.

~~**503.12 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

Public Hearing Results

The following is errata that was not posted to the ICC website:

406.1 503.1 Building site Waste management plan for land clearing debris and excavated soils. 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.

(Portions of proposal not shown do not have errata.)

(Errata already incorporated into cdpACCESS.)

Committee Action:

Disapproved

Committee Reason: The Committee disapproved this proposal based on the Committee's action on GG137-14 and furthermore, because of the removal of the sections indicated.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Submitted.

Commenter's Reason: There was significant errata to this proposal that caused an essentially simple proposal to seem complex and irrational. This, understandably, caused a great deal of confusion for the IgCC General Committee. For example, the committee reason indicated that there were no good reasons for the deletions. The deletions, however, were all either errata or relocations of requirements from Chapter 4 to Chapter 5. The corrected proposal contained no deletions. The proposed code change is correctly shown in this document. The SEHPCAC respectfully requests that the voting membership consider the proposal as it is presented herein, along with the original reason statement.

Note that, though it initially may appear that the criteria that defines landclearing debris is deleted from the code, it is only deleted from new section 503.2, because it is no longer applicable there. This criteria remains, however, in new Section 503.1.

This comment 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>.

GG138-14

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

Proposed Change as Submitted

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.

GG140-14: 407-MEDINA1193

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Section 407.2.1 includes multiple buildings by including "building site" but Section 407.2.3 requires that the bike rack be located within 100 feet of the building. This seems inconsistent because you don't know in which building on a building site having multiple buildings, the bike rack is required. There is no justification for removal of a number of the sections that are deleted by this proposal.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

**Hope Medina, Cherry Hills Village, representing self (hmedina@coloradocode.net);
Craig Conner (craig.conner@mac.com) request Approve as Modified by this Public Comment.**

Modify the proposal as follows:

407.2.2 Description of spaces. Bicycle parking spaces shall comply with the following:

1. ~~Shall Horizontal parking spaces shall have an a floor area of not less than 18 inches (457 mm) by 60 inches (1524 mm) for each bicycle;~~
2. ~~Vertical Parking spaces shall have a floor area of not less than 18 inches (457mm) by 44 inches (1118) per bicycle with not less than 24 inches (610 mm) of clearance above the highest point of the bicycle rack;~~
23. Shall be provided with a rack or other facility for locking or securing each bicycle.

Commenter's Reason: This updates the bicycle space description in A304.2.2. To be consistent with the approved GG146, this increases the size for bike parking spaces. To be consistent with GG148 this adds the dimensions for vertical bike storage as an option.

GG140-14

GG141-14

407.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The current building site characteristics are important. The proposed language is too restrictive. The building official can interpret the existing language.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Susan Gitlin, representing US Environmental Protection Agency (gitlin.susan@epa.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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 the of building site is in accessible to bicyclists such as characteristics including, but not limited to, inaccessibility to bicyclists, such as where the building site is accessible only via controlled-access highways.

Commenter's 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.

At the Memphis hearings, the Committee remarked that it is was important to retain an exception that allowed for a reduction due to building site characteristics. This modification therefore reintroduces that wording into the exception, but merely provides a clearer example than what is currently contained in the code.

GG141-14

GG143-14

407.3

Proposed Change as Submitted

Proponent: Ed Fendley, US Environmental Protection Agency, representing (Fendley.ed@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 spaces	2 spaces
	Concert halls, theaters other than for movies	1 per 500 seats	
A-2	Restaurants	1 per 50 seats; not less than 2 spaces	
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 2 spaces	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 2 spaces	1 per 25,000 square feet; not less than 2 spaces
E	Schools	None <u>Not less than 2 spaces</u>	1 per 250 square feet of classroom area

OCCUPANCY	SPECIFIC USE	SHORT-TERM SPACES	LONG-TERM SPACES ^b
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 spaces	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 spaces	1 per 25,000 square feet; not less than 2 spaces
R-2, R-3, R-4	All	None Not less than 2 spaces	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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The current building site characteristics are important. The proposed language is too restrictive. The building official can interpret the existing language.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Susan Gitlin, representing US Environmental Protection Agency (gitlin.susan@epa.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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^a
BICYCLE PARKING^b

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 seats	
A-2	Restaurants	1 per 50 seats; not less than 2 spaces	
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 2 spaces	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 2 spaces	1 per 25,000 square feet; not less than 2 spaces
E	Schools	Not less than 2 spaces	1 per 250 square feet of classroom area
E, I-4	Day care	Not less than 2 spaces	2 spaces
F, H	All	Not less than 2 spaces	1 per 25,000 square feet; not less than 2 spaces
I-1	All	Not less than 2 spaces	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 square feet; not less than 2 spaces	1 per 50,000 square feet; not less than 2 spaces
R-1	Hotels, motels, boarding houses	Not less than 2 spaces	1 per 25,000 square feet; not less than 2 spaces

OCCUPANCY	SPECIFIC USE	SHORT-TERM SPACES	LONG-TERM SPACES ^b
R-2, R-3, R-4	All	Not 1 per 20 sleeping units; not less than 2 spaces	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

Commenter's Reason: The Committee noted that it could be insufficient to require only two short-term bicycle spaces for buildings with multiple units. The proposal is therefore revised to require 1 bicycle space per 20 sleeping units, the minimum rate recommended in the APBP Bicycle Parking Guidelines.

GG143-14

GG144-14

407.3, 407.3.1, 407.3.2

Proposed Change as Submitted

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	500 50 seats; not less than 4 spaces	
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 50 seats; not less than 4	1 per 50,000 square feet; not less than 2 spaces
A-3	Assembly spaces other than places of worship	1 per 50 seats <u>or 1 per 25,000 square feet, whichever is greater</u> ; not less than 2 spaces	
A-4 – A-5	All	1 per 500 seats; not less than 4	2 spaces
B	All	1 per 50,000 20,000 square feet; not less than 2 spaces	1 per 25,000 10,000 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 <u>20,000</u> square feet; not less than 2 spaces	1 per <u>20 employees or</u> 50,000 square feet; not less
R-1	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	per 20 <u>motor vehicle</u> parking spaces
	Commercial <u>motor vehicle</u> parking facilities	1 per 20 <u>motor vehicle</u> parking spaces; <u>not less than 6 spaces</u>	None <u>1 per 20 motorized vehicle parking spaces; not less than 2 spaces. 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~~ 72 inches (~~1524~~ 1829 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

Public Hearing Results

The following is errata that was not posted on the ICC website:

407.3.2 Long-term bicycle parking. Long-term bicycle parking shall comply with all of the following:

3. It shall have an area of not less than 18 inches (457 mm) by ~~60~~ 72 inches (~~1524~~ 1829 mm) for each bicycle; and

*(Portions of proposal not shown remain unchanged)
(Errata already incorporated into cdpACCESS)*

Committee Action:

Approved as Submitted

Committee Reason: The proposed table is more complete. This action is compatible with prior committee action on GG142-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Dru Meadows, theGreenTeam, Inc., representing Walmart (dmeadows@thegreenteaminc.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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
M	All	1 per 20,000 square feet; not less than 2 spaces	1 per 20 employees ^c or 50,000 square feet; not less than 2 spaces

(Portions of table not shown remain unchanged)

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.
- c. Employee count shall be determined based on the estimated number of full-time plus part-time employees working in the building at any one time. It shall not include temporary employees. It shall not include employees who work primarily off-site.

Commenter's Reason: Employee Count is different than Occupancy Load. It is not clear how the new requirements will be interpreted or enforced on the basis of Employee Count. This modification is intended to provide some clarification.

Employee Count will vary based on the type of occupancy. The new requirements associated with Employee Count have been introduced into the table only for retail (i.e., employee count was not added for offices, hotels, schools, industrial or other commercial structures) so this modification only adds clarification related to use of the term "employee" in retail operations.

In retail operations, there are three main types of on-site employees:

- Full time, regular.
- Temporary (or seasonal).
- As currently written, the term employee might be interpreted to include temporary workers. This can be difficult to estimate. For example, a single store may not hire seasonal employees one Christmas, but hire several the next Christmas.

In retail operations, there may be off-site employees such as delivery personnel and administrative (or headquarters) personnel. As currently written, the term "employee" might be interpreted to include off-site employees.

Additionally, not all employees will be in the building at the same time – especially for 24/7 operations. Offices and manufacturing facilities may utilize regular, employee shifts, so the employee count could be based on the number of employees in overlapping shifts. However, retail operations usually schedule employees to parallel customer traffic. In either case, the Employee Count should be based on the number of employees that would be in the building at any one time.

Public Comment 2:

Maureen Traxler, city of Seattle Dept of Planning & Development, representing Washington Association of Building Officials Technical Code Committee (maureen.traxler@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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
M	All	1 per 20,000 square feet; not less than 2 spaces	1 per 20 employees or 50,000 square feet; not less than 2 spaces

Commenter's Reason: Often the number of employees, or even the identity of the tenants of a building, is not known until the building is completed. The square footage of the building is almost always shown on the plans, and it is a verifiable number that doesn't require additional calculation by either the building designer or the code official. The number of employees changes over time while the size of the building remains constant. Group M is the only occupancy for which the number of employees is a factor, so this comment makes it consistent with other occupancies.

GG144-14

GG145-14

407.3.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The existing requirement of 100 feet is close enough because making it closer might create conflicts with accessibility access requirements.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Susan Gitlin, representing US Environmental Protection Agency (gitlin.susan@epa.gov) requests Approve as Submitted.

Commenter's Reason: People who ride bicycles to run errands, visit a shop or restaurant, or make deliveries look for a bicycle parking space near the entrance to the building. As a result, guidance on bicycle parking emphasizes the importance of placing short-term bicycle parking within 50 feet of the building entrance.

For example:

Guidance from Arlington County, Virginia, says that "[V]isitor bicycle parking should be installed in an area highly visible to, and within 50 feet of, the main entrance to the building or business it is intended to serve." (Arlington County Commuter Services, Arlington County Guide to Effective Bicycle Parking, February 2014)

Denver, Colorado's website includes this statement: "Racks should either be installed in the public Right-Of-Way, or on private sites in conformance with front setback requirements. Whenever possible, the racks should be placed within 50' of building entrances where bicyclists would naturally transition to pedestrian mode." (See <https://www.denvergov.org/bikeprogram/BicyclinginDenver/BikeParking/tabid/438244/Default.aspx>)

Houston, Texas promotes a set of guidelines that state that "The rack area should be located along a major building approach line and clearly visible from the approach. The rack area should be no more than a 30-second walk (120 feet) from the entrance it serves and should preferably be within 50 feet." Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines, 2002, http://edocs.publicworks.houstontx.gov/documents/divisions/planning/bikeway/apbp_bikepark_guide1.pdf.

GG145-14

GG147-14

407.3.1, 407.3.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The criteria for 2 points of contact for the bicycle is important and is consistent with the Association of Pedestrian and Bicycle Professionals. This proposal makes it more convenient for lockability. This encourages design opportunities for bicycle racks.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Hope Medina, representing self (hmedina@coloradocode.net) requests Disapprove.

Commenter's Reason: Where bicycle parking is going to be provided we do not need to limit the options of what can be used for parking. I have witnessed vertical parking spaces in daily use that work great for the users, but would not meet the requirements in this code change. We should be open to options and creativity for the required bicycle parking, not exclude possibilities.

GG147-14

GG149-14

407.3.2

Proposed Change as Submitted

Proponent: Ed Fendley, U.S. Environmental Protection Agency (Fendley.ed@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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal creates confusion and offers no clarity. The existing text is preferred as it is clearer.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Susan Gitlin, representing US Environmental Protection Agency (gitlin.susan@epa.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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 be within a building, ~~comply with both of the following:~~

1. ~~They shall provide permanent cover including, but not limited to, roof overhands, awnings ceilings of rooms or bicycle storage lockers.~~
2. ~~They shall be within a building;~~ covered 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.

Commenter's Reason: The Committee in Memphis found the proposed wording to be unclear. We have therefore streamlined the language, but maintained the dual intentions of the original code and the proposal: to provide protection from weather and theft.

See, for example, the Arlington County Guide to Effective Bicycle Parking from Arlington, VA, February 2014, p. 2: "Class 1 secure bicycle parking provides building tenants (residents or employees) with long-term bike parking with three key characteristics:

1. Protection from weather (including wind, rain, and snow), and
2. Two levels of protection from theft:
 - a. a locked room or cage with controlled access only for bike users
 - b. racks within the enclosure to which bikes may be secured using a "standard lock"

GG149-14

GG150-14

407.3.2

Proposed Change as Submitted

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/fcsfSEHPCAC/Pages/default.aspx>.

Cost Impact: Will not increase the cost of construction.

GG150-14: 407.3.2-PAARLBERG425

Public Hearing Results

Committee Action:

Approve as Submitted

Committee Reason: Restrictions on travel distance for bicycle parking is unnecessary. It doesn't make any difference whether you ride a bicycle to the site or you drive a car to the site. You park the bicycle or the car in the same location and have to walk 500 feet to the building. This arrangement seems to work well without any problems at many locations in many jurisdictions.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Susan Gitlin, representing US Environmental Protection Agency (gitlin.susan@epa.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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 or 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, 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.

Commenter's Reason: The original proposal (GG-150) results in a sentence that 1) adds no value to the code and 2) eliminates the preferred parking status that the code intends to provide bicyclists. This modification addresses those problems by reinstating the original language for that part of the proposal.

It is important that the original language in 407.3.2(1) be reinstated for the following reasons:

- a) The statement that long-term parking "shall be located on the same building site or within the building" is an obvious statement and therefore need not be included in the code.
- b) The original language provides flexibility to the builder by providing an option to either place the long-term bicycle parking within the building or within 300 feet of the main entrances. The proposed language would only require that the long-term bicycle parking be somewhere on the site. For large facilities and multiple-building projects, this could mean that it is acceptable to locate long-term bicycle parking acres away from the entrance. This is at odds with the goals of this section and the code.
- c) The commenter argued that 407.3.2(1) does not fit the needs of multiple-building sites. This is not true. The item was written with such sites in mind, which is why it specifies "main entrances" (plural), rather than a singular entrance.

GG150-14

GG151-14

407.4, 407.4.1, 407.4.2

Proposed Change as Submitted

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 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.

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

Public Hearing Results

The following is errata that was not posted to the ICC website:

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.

(Portions of proposal not shown do not have errata.)

(Errata already incorporated into cdpACCESS.)

Committee Action:

Disapproved

Committee Reason: The current language is intended to be an encouragement for people to use "greener" vehicle transportation if they drive to a building site. There doesn't seem to be any significant additional cost for building owners to offer this encouragement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Greg Johnson, representing self (gjohnsonconsulting@gmail.com) requests Approve as Submitted.

Commenter's Reason: The committee reason re: cost to the owner is not relevant; the issue is economic justice and whether government should reward people who have more resources to spend on their vehicles than other folks in the community.

It is not the intent of the code to keep people down by law. Preferred parking for the economically advantaged needs to go away.

GG151-14

GG152-14

407.4.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposed language further complicates enforcement of this code section.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Submitted.

Commenter's Reason: This provision will be easy for code officials to enforce, as it will only require the sign to be modified and for the official to ensure that the language on fuel economy is added to the sign.

Public Comment 2:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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~~ 35 MPG or ~~40~~ 35 MPGe.

Commenter's Reason: This public comment would reduce the minimum EPA MPG rating for cars to qualify for a preferred parking space from 40 to 35.

The Committee discussion recognized that it would be wrong to allow a car that only got 20 MPS to qualify for a preferred space simply because it was an alternative fueled vehicle. Currently there are several hybrids that are rated around 20 MPG.

This public comment keeps the original idea but reduces the minimum efficiency requirement.

GG152-14

GG153-14

407.4.2.1 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal gives preference to one type of vehicle. It does not account for hydrogen fuel cell vehicles and other alternative vehicles. Who pays for the cost of the electricity? At some point, this must be an owner decision rather than a jurisdictional decision. It is not clear whether this proposal applies to existing buildings and retrofits.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Marilyn Williams, National Electrical Manufacturers Association, representing National Electrical Manufacturers Association (mar_williams@nema.org) request Approve as Submitted.

Commenter's Reason: The committee was in error in approving this proposal without consideration of the floor modification that was proposed. The floor modification had the endorsement of the proposal's proponent. The committee's rationale for not approving the floor modification was that it did not maintain consistency with the IECC. It is respectfully submitted that the IECC is deficient in using only the term "device" to satisfy this requirement because it implies that only one device can be utilized, when in actuality it requires a system to comply. Just because the IECC has it wrong, does not mean it should be propagated into this code, thusly making the IECC un-enforceable. The committee's approved language will make the enforcement of this code very difficult because the requirement cannot be satisfied with a single device. A system is required in order to comply with this requirement. It is respectfully requested that the members make their lives less complicated by approving this public comment.

Public Comment 2:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

407.4.2.1 Electric vehicle parking charging stations. Where ~~250~~ 200 or more parking spaces are provided for a building project that has a total building floor area of ~~400,000~~ 50,000 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.

Commenter's Reason: This modification improves the proposal. For stand-alone retail stores, a common "rule of thumb" is to provide 4 parking spaces for every 1,000 square feet of retail space.

Public Comment 3:

Wayne Stoppelmoor, representing Schneider Electric (wayne.stoppelmoor@schneider-electric.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

407.4.2.1 Electric vehicle parking charging stations. Where ~~250~~ 300 or more parking spaces are provided for a new 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 ~~4~~ 0.5 percent, rounded to the nearest whole number, of the number of parking spaces provided.

Commenter's Reason: The committee disapproved this proposal stating that it "gives preference to one type of vehicle." However, in its disapproval of GG-154, the committee admitted that electric is the only readily available fuel type by stating "the only one readily available is electric." Electric vehicles far outnumber other alternative fuel types and their use is growing much faster than the other fuel types. Additionally, the committee questioned who pays for the fuel used by the charging station. That question is outside the scope of the code and is the choice of the building / charging station owner. Furthermore, the committee answered its own question by stating "At some point, this must be an owner decision." The proposal applies to new construction and was made clear by this proposed public comment. It should also be pointed out that regular 120V receptacle outlets would be sufficient to satisfy the requirement. Finally, this public comment makes the requirement less stringent by increasing the threshold to 300 parking spaces and reducing the number of charging stations required.

GG153-14

GG154-14

202 (New), 407.4.3 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Although the definition allows many alternative fuel types, the only one readily available is electric. Other alternative fuels should have also been addressed. Who pays for the fuel?

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Marilyn Williams representing National Electrical Manufacturers Association (mar_williams@nema.org) request Approve as Submitted.

Commenter's Reason: The committee's reason for disapproving this proposal is perplexing. It states that "although the definition allows many alternative fuel types, the only one readily available is electric." This proposal addresses other alternative fuel types. However, in disapproving GG-153 and GG-155, the committee states that they should've addressed other fuel types. The committee's logic does not make sense. Either the committee should have i) approved GG-153 or GG-155 because they require only electric as the committee states here in that electric is the only available fuel type or ii) approved this proposal because it addresses alternative fuel types. The committee questioned who pays for the fuel. That question is outside the scope of this code. If the question is within the scope of the code, the answer is that the building / charging station owner chooses who pays for the fuel

Public Comment 2:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 10,000 square feet (929 m2) 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~~ one alternative fuel-vehicles vehicle shall be installed.

Commenter's Reason: This proposal allows the use of all alternative fueled vehicle refueling or recharging stations, not just electric vehicle charging stations. The modification simplifies the requirement and should eliminate any enforcement concerns.

Public Comment 3:

Wayne Stoppelmoor, representing Schneider Electric (wayne.stoppelmoor@schneider-electric.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 ~~40,000~~ 25,000 square feet (~~929~~ 2323 m2) 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~~ one alternative fuel vehicles vehicle shall be installed.

Commenter's Reason: The committee disapproved this proposal stating that it "gives preference to one type of vehicle." However, in its disapproval of GG-154, the committee admitted that electric is the only readily available fuel type by stating "the only one readily available is electric." Electric vehicles far outnumber other alternative fuel types and their use is growing much faster than the other fuel types. Additionally, the committee questioned who pays for the fuel used by the charging station. That question is outside the scope of the code and is the choice of the building / charging station owner. Furthermore, the committee answered its own question by stating "At some point, this must be an owner decision." The proposal applies to new construction and was made clear by this proposed public comment. It should also be pointed out that regular 120V receptacle outlets would be sufficient to satisfy the requirement. Finally, this public comment makes the requirement less stringent by increasing the threshold to 300 parking spaces and reducing the number of charging stations required.

GG154-14

GG155-14

302.1, 407.4, 407.4.3 (New)

Proposed Change as Submitted

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	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
402.3	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 CO ₂ e 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 emissions reporting	<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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The ratio is too high. The proposal should also address other alternative fuel vehicles.

Assembly Motion:

As Submitted

Online Vote Results:

Failed - Support: 40.37% (65) Oppose: 59.63% (96)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Marilyn Williams representing National Electrical Manufacturers Association (mar_williams@nema.org) requests Approve as Submitted.

Commenter's Reason: The committee disapproved this proposal because the ratio is too high. It is respectfully submitted that the committee was confused in their review of the proposal. The committee thought the requirement was requiring 2% of the total parking spaces are required to have a charging station. The proposal states that only 2 parking spaces be provided for the first 250 total parking spaces. Furthermore, in actuality, only one duplex charging station (or 120 V receptacle) is required because it could service 2 spaces. The committee also stated that the proposal should address other alternative fuel vehicles. It is respectfully submitted that the committee's action is perplexing because it disapproved GG-154 although it did allow for other fuel types. In its disapproval of GG-154, the committee admitted that electric is the only readily available fuel type by stating "the only one readily available is electric." Furthermore, electric is the only fuel type used in alternative fueled vehicles that can be provided in a building environment. Electric vehicles far outnumber other alternative fuel types and their use is growing much faster than the other fuel types. In other proposals, the committee questioned who pays for the fuel used by the charging station. That question is outside the scope of the code and is the choice of the building / charging station owner. The proposal applies to new construction.

Public Comment 2:

Kathleen Petrie representing City of Seattle, Department of Planning and Development (kathleen.petrie@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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**

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 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>407.5</u>	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

407.4.3 407.5 Electric vehicle charging stations. Section 407.5 shall be mandatory and enforced only where specifically indicated by the jurisdiction in Table 302.1. 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.

Commenter's Reason: This public comment renumbers the newly created electric vehicle charging station section from 407.4.3 to 407.5. Section 407.4 identifies where preferential parking shall be located for vehicles defined in sections 407.4.1 and 407.4.2, whereas the newly proposed section is a specification for how many electric vehicle charging stations are required. The renumbered section is then modified with language referring users back to Table 302.1, as is typical for all Jurisdictional Requirements.

Public Comment 3:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

407.4.3 Electric vehicle charging stations. Where 250 125 or more parking spaces are provided for a building project that has a total building floor area of 400,000 50,000 square feet or greater, not less than 2 electric vehicle charging stations shall be provided. For each additional 400 125 parking spaces greater than 250 125, an additional electric vehicle charging station shall be provided.

Commenter's Reason: A parking lot with 125 spaces or more will have enough space to install at least two electric vehicle charging stations.

Public Comment 4:

Wayne Stoppelmoor, representing Schneider Electric (wayne.stoppelmoor@schneider-electric.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

407.4.3 Electric vehicle charging stations. Where 250 300 or more parking spaces are provided for a new building project that has a total building floor area of 100,000 square feet or greater, not less than 2 1 electric vehicle charging stations station shall be provided. ~~For each additional 100 parking spaces greater than 250, an additional electric vehicle charging station shall be provided.~~

Commenter's Reason: This public comment revises the proposal to be much less stringent by increasing the threshold of parking space from 250 to 300, reducing the number of charging stations required from 2 to 1, and not requiring any more than 1 charging station no matter the number of parking spaces available. Additionally, this public comment makes it clear that the requirement only applies to new building projects. In regards to the committee's comment that the proposal should also address other alternative fuel vehicles; in its disapproval of GG-154, which did address alternative fuel vehicles, the committee admitted that electric is the only readily available fuel type by stating "the only one readily available is electric." Electric vehicles far outnumber other alternative fuel types and their use is growing much faster than the other fuel types. Therefore, it is respectfully submitted that this public comment be approved.

GG155-14

GG156-14

408.2.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason:

The existing language needs to remain in the code to help mitigate the problem of heat island effect.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Heather Dylla, National Asphalt Pavement Association, representing National Asphalt Pavement Association (hdylla@asphaltpavement.org) requests Approve as Modified by this Public Comment.

Replace the proposal as follows:

Revise as follows:

A104.9 Heat island. Project electives related to heat island impact shall comply with Sections A104.9.1 through A104.9.4. Compliance with multiple electives shall be recognized.

A104.9.1 Site hardscape project elective 1. In climate zones 1 through 6, as established in the *International Energy Conservation Code*, the development of a new building and associated site improvements where a minimum of ~~75~~ 50 percent of the site hardscape is in accordance with one or any combination of options in Sections A104.10.1 through A104.10.5 ~~408.2.1 through 408.2.4~~, shall be recognized as a project elective.

A104.9.2 Site hardscape project elective 2. In climate zones 1 through 6, as established in the *International Energy Conservation Code*, the development of a new building and associated site improvements where a minimum of ~~400~~ 75 percent of the site hardscape is in accordance with one or any combination of options in Sections A104.10.1 through A104.10.5 ~~408.2.1 through 408.2.4~~, shall be recognized as a project elective.

A104.9.3 Site hardscape project elective 3. In climate zones 7 and 8, as established in the *International Energy Conservation Code*, the development of a new building and associated site improvements where a minimum of 50 percent of the site hardscape is in accordance with one or any combination of options in Sections A104.10.1 through A104.10.5 ~~408.2.1 through 408.2.4~~, shall be recognized as a project elective.

A104.9.4 Roof covering project elective. In climate zones 4 through 8, as established in the *International Energy Conservation Code*, the development of a new building with roof coverings in accordance with Section 408.3, shall be recognized as a project elective.

A104.10-408.2 Site hardscape project elective requirements. In climate zones 1 through 6, as established in the *International Energy Conservation Code*, not less than 50 percent of the site hardscape shall be provided with one or any combination of options described in Sections 408.2.1 through 408.2.4. ~~The provisions of Sections A104.10.1 through A104.10.5 shall be utilized in accordance with Sections A109.4.1 through A104.9.3 where the intent is to qualify for site hardscape project electives.~~ For the purposes of this section ~~these sections~~, site hardscape shall not include areas of the site covered by solar photovoltaic arrays or solar thermal collectors.

~~408.2.1~~ **A104.10.1 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.

~~408.2.2~~ **A104.10.2 Shading by structures.** Where shading is provided by a building or structure or a building element or component, such building, structure, component or element shall comply with all of the following:

1. Where open trellis-type, free-standing structures such as, but not limited to, covered walkways, and trellises or pergolas, are covered with native plantings, the plantings shall be designed to achieve mature coverage within five years;
2. Where roofed structures are used to shade parking, those roofs shall comply with Section 408.3 in climate zones 1 through 6; and

3. Shade provided onto the hardscape by an adjacent building or structure located on the same lot shall be calculated and credited toward compliance with this section based on the projected peak sun angle on the summer solstice.

408.2.3 A104.10.3 Shading by trees. Where shading is provided by trees, such trees shall be selected and placed in accordance with all of the following:

1. Trees selected shall be those that are native or adaptive to, the region and climate zone in which the project site is located. Invasive plant species shall not be selected. Plantings shall be selected and sited to produce a hardy and drought resistant vegetated area;
2. Construction documents shall be submitted that show the planting location and anticipated ten year canopy growth of trees and that show the contributions of existing tree canopies; and
3. Shading calculations shall be shown on the construction documents demonstrating compliance with this section and shall include only those hardscape areas directly beneath the trees based on a ten year growth canopy. Duplicate shading credit shall not be granted for those areas where multiple trees shade the same hardscape.

408.2.4 A104.10.4 Pervious and permeable pavement. Pervious and permeable pavements including open grid paving systems and open-graded aggregate systems shall have a percolation rate not less than 2 gallons per minute per square foot (100 L/min x 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.

A104.10.5 Porous Asphalt Pavement. Porous asphalt pavements with open-graded asphalt mixtures with percent air voids not less than 16 percent as determined by testing in accordance with ASTM D3203. Porous asphalt pavements 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.

Commenter's Reason: Urban heat island is a complex issue that is context specific. Outside of metropolitan areas, urban heat island mitigation is unlikely to be a significant concern for building sites. Therefore, in response to recommendations received by the Committee Action Hearing, instead of removing the mitigation section 408.2.1 of the code, the entire section 408.2.1 thru 408.2.5 is more appropriate as an elective in Appendix A: Project Elective.

Furthermore, currently, section 408.2.1 mandates urban heat island (UHI) mitigation for not less than 50% of site hardscape with material as having a solar reflectance value of not less than 0.30. In doing so, this code neglects many other factors that are required for optimizing hardscape designs, such as pavement loads, environmental conditions, soil strength, and cost; thus it determines the hardscape material based on one feature, its color. As a result, asphalt pavements, which have many other sustainable facets such as reusing asphalt pavements or recycling other waste materials including tires and shingles, are currently not allowed. This makes the current form of IgCC an outlier as the only green standard, rating system or code to effectively ban the use of asphalt, the most commonly used paving material.

In addition, currently, section 408.2.4 is restrictive, only permitting the use of permeable unit pavers and pervious concrete thus eliminating other common permeable pavements materials such as porous asphalt. To address this issue, this public comment adds a specific section explicitly for porous asphalt pavements as a method of urban heat island mitigation (in lieu of modifying the existing section 408.2.4.), as suggested by one of the IgCC Committee members during the Committee Action Hearings.

Porous asphalt is recognized as a "cool pavement technology" by the U.S. EPA (EPA). Research studies have shown that porous pavements are an effective means to mitigate urban heat island (UHI) effect due to their high air void nature which can reduce stored heat, and allow for rapid cooling via evaporation (Kevern 2012).

In addition, there are many other benefits to porous asphalt pavements including: improved water quality, reduction in deicing chemicals by as much as 75%, and asphalt pavements can be 100% recyclable.

GG156-14

GG159-14

408.2.4

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposed concept of air voids is too complicated to understand and will be unenforceable. The existing requirement for a minimum flow rate of 2 gallons per minute is easy to understand and enforce.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Heather Dylla, National Asphalt Pavement Association, representing Nationals Asphalt Pavement Association (hdylla@asphaltpavement.org) requests Approve as Modified by this Public Comment.

Replace the proposal as follows:

408.2 Site hardscape. In climate zones 1 through 6, as established in the International Energy Conservation Code, not less than 50 percent of the site hardscape shall be provided with one or any combination of options described in Sections 408.2.1 through 408.2.4 408.2.5. For the purposes of this section, site hardscape shall not include areas of the site covered by solar photovoltaic arrays or solar thermal collectors.

408.2.5 Porous Asphalt Pavements. Porous asphalt pavements include open-graded asphalt mixtures with percent air voids not less than 16% determined by testing in accordance with approved standards. Porous asphalt pavements 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.

Commenter's Reason: In response to a suggestion made by one of the IgCC Committee Members during the Committee Action Hearing, this public comment alters the original proposal by adding a specific section explicitly for porous asphalt pavements as a method of urban heat island mitigation (in lieu of modifying the existing section 408.2.4., as previously suggested.) Currently, section 408.2.4 is restrictive, only permitting the use of permeable unit pavers and pervious concrete thus eliminating other common permeable pavements materials such as porous asphalt.

Porous asphalt is recognized as a "cool pavement technology" by the U.S. EPA. In addition, the original proposal noted research studies which have shown that the porous pavements are an effective means to mitigate urban heat island (UHI) effect due to their high air void nature which can reduce stored heat, and allow for rapid cooling via evaporation.

Furthermore, there are many other benefits to porous asphalt pavements including: improved water quality, reduction in deicing chemicals by as much as 75%, and asphalt pavements can be 100% recyclable.

ASTM D3203 is a commonly accepted industry standard for the determination of the percentage of air voids in asphalt pavement. However, new standards cannot be introduced in the Public Comment period. As such, this proposal utilizes the verbiage "approved industry standards."

Bibliography:

Reducing Urban Heat Island Compendium of Strategies: Cool Pavements, EPA
<http://www.epa.gov/heatisland/resources/pdf/CoolPavesCompendium.pdf>

GG159-14

GG162-14

408.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

408.3 Pervious and permeable pavement. Pervious.....

Exceptions: 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.....
2. Solar.....
3. Roof.....

4. Portions.....
5. Rooftop.....
6. Portions of roofs that are ballasted roofs with a minimum stone ballast of 17 pounds per square foot (psf) lb/ft² (74 kg/m²) or 23 psf lb/ft² (117 kg/m²) for pavers.

Committee Reason: The committee recommended that this proposal be approved based upon the proponent's published reason statement. The modification adds flexibility.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Jay Crandell, ARES Consulting, representing EPDM Roofing Association (jcrandell@aresconsulting.biz) requests Approve as Modified by Committee.

Commenter's Reason: This proposal was approved as modified by committee at the first hearing because it provides needed flexibility in green roof surface choices, is consistent with the IECC base code, and has several "green roof" benefits justified by DOE/ORNL research and others as explained in the original proposal's reason statement. The ICC membership is urged to sustain the committee's action to approve as modified.

Public Comment 2:

Amy Dickie, representing Global Cool Cities Alliance (amy@globalcoolcities.org) requests Disapprove.

Commenter's Reason: Ballasts improve building energy efficiency by increasing the thermal mass rather than by reflecting solar energy. It is very difficult to establish an accurate trade-off between the two. Ballasted roofs are a good option for energy efficiency in some regions and microclimates, but are not appropriate as a blanket exception. Further, because ballasted roofs tend to hold solar energy and release it at night, they may provide little overall benefit in relation to urban heat island effects.

GG162-14

GG163-14

408.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Based on the testimony at the hearings, there is a lack of support to apply these requirements above Climate Zone 3.

Assembly Motion:

As Submitted

Online Vote Results:

Failed - Support: 36.67% (66) Oppose: 63.33% (114)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Amy Dickie, representing Global Cool Cities Alliance (amy@globalcoolcities.org) requests Approve as Submitted.

Commenter's Reason: Several new additional studies supporting the need for cool roofs in climate zone 4 have or will be published between the Memphis and Ft. Lauderdale hearings. The proponents will make this body of research available to the assembly, and we believe the entire assembly should have the opportunity to consider this issue at that time.

Public Comment 2:

Mike Fischer, RCMA and ARMA, representing The Roof Coatings Manufacturers Association and the Asphalt Roofing Manufacturers Association (mfischer@kellenccompany.com) requests Disapprove.

Commenter's Reason: Reason: The proposal intends to extend cool roof requirements used for heat island mitigation in Chapter 4 into climate zone 4. The envelope energy efficiency requirements in the IgCC are based on an incremental increase of performance values (R-Value, U-Factor etc.) that is 10% higher than the IECC. Given the fact that there is no requirement for Climate Zone 4 in the base code, this proposal adds a much greater increase above the base code, and does so in areas of the country where the benefit of cool roofing is greatly reduced. The extension of cool roof requirements into Climate Zone 4 was disapproved in the 2015 IECC; it makes no sense to add it into the IgCC, especially at the proposed levels.

The IgCC currently uses cool roofing as an alternative to vegetative roofing as a heat island mitigation strategy. Heat island mitigation is a local need, and is best left to local authorities. Another proposal (GG77) that was recommended for approval by the IgCC code development committee changes this requirement to a jurisdictional option for Climate Zones 1-3. This approach makes more sense.

GG163-14

GG164-14

408.3.1.2, 408.3, 408.3.1.1, 408.3.1

Proposed Change as Submitted

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-ft^2 ($12 \text{ W/m}^2 \times \text{k}$) 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 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.~~

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal ignores the benefits of cool roofs as related to heat island mitigation. It is well documented by Lawrence Berkley Laboratories and Arizona State University studies that roof surfaces contribute to heat island mitigation. This proposal eliminates choices and, after these choices are eliminated, would require that all structures that provide shade to parking would have to be provided with vegetative roofs. That is too extreme. Cool roof technology is an affordable and effective technology.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mike Fischer, representing The Asphalt Roofing Manufacturers Association (mfischer@kellenccompany.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

605.2 Roof coverings—solar reflectance and thermal emittance. Roof coverings shall comply with the roof reflectance requirements in the International Energy Conservation Code.

Exception: Roofs with less than 2:12 in roof pitch in Climate Zones 1-3 shall have a three-year aged reflectance of not less than 0.61 and a three-year aged thermal emittance of not less than 0.75, or a 3-year aged solar reflectance index of not less than 60.

Commenter's Reason: This public comment moves the roof reflectance requirements to Chapter 6 in order to properly include them in the energy efficiency requirements. The pointer from the heat island mitigation in Chapter 4 is retained. The values for solar reflectance are modified to be consistent with the general presumption for above code performance of envelope requirements. Insulation and fenestration requirements in the IgCC are 10% greater than prescriptive values in the IECC; this proposal sets the bar for cool roofing at the same level. It further omits steep slope requirements because they are not in the base code.

GG164-14

GG166-14

408.3.1, Table 408.3.1

Proposed Change as Submitted

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	60-78
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

Public Hearing Results

The following is errata that was posted to the ICC website:

**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	60-78

(Portions of table and proposal not shown do not have errata.)

(Errata already incorporated in cdpACCESS.)

Committee Action:

Approved as Submitted

Committee Reason: Because this is limited to Climate Zones 1 thru 3 and based on the information in the testimony given and the information available on the subject, this proposed language is going to help the IgCC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Mike Fischer, ARMA, representing The Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 an approved 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	0.65	0.75	78
Greater-Less than 2:12	0.30 0.61	0.75	25-60
2:12 and greater	NR	NR	NR

Commenter's Reason: The proposal sets reflectance requirements at 18% above the base requirement in the IECC for low-slope roofs, and sets values for steep-slope roofs that do not correspond with any above-code metrics from the IECC Commercial provisions because the IECC does not apply. The modification in this public comment sets the values for solar reflectance to be consistent with the general presumption for above code performance of envelope requirements. Insulation and fenestration requirements in the IgCC are 10% greater than prescriptive values in the IECC; this proposal sets the bar for cool roofing at the same level. It further omits steep slope requirements because they are not in the base code. The phrase "nationally recognized" is replaced with approved to avoid limiting options and using the appropriate defined term.

Public Comment 2:

Craig Tyler, Carlisle Construction Materials, representing Carlisle Construction Materials (Craig.tyler@syntec.carlisle.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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	0.65 0.575	0.75	78 64
Greater than 2:12	0.30	0.75	25

Commenter's Reason: The proposal made by the proponent brought up several issues which were discussed at the Memphis Hearings in April, but were not thoroughly explained. The first item is that IgCC should match current "leading green codes". The inclusion of a modification for Table 408.3.1 increases the aged SRI as well as increases the aged solar reflectance which would "match CalGreen Tier 2".

The current, nationally recognized and used, green building certification systems in the US and Canada are:

USGBC's LEED V4 (Published 11/2013, but not in full effect until 6/1/2015)
Low slope roofing to have a minimum 3 Year Aged SRI of 64 for the Sustainable Site Credit

GBI's Green Globes 2013 (Published 11/2013)
Low Slope roofing to have a minimum initial SRI of 78 for the Site Credit

[Both of these are the only green building certification systems recognized as suitable for use by the General Services Administration.]

The current green building standard used in the State of California is:

CalGreen 2013 (Published 7/2013 and effective as of 1/1/2014)
Low slope roofing is to follow CA Title 24, Part 6 standard of a minimum SRI of 78 for compliance
Those wishing to exceed the mandatory minimum may adopt higher levels of :
Voluntary (Non-Residential) Tier 1 - Low sloped roofing, a minimum 3 Year Aged SRI 64
Voluntary (Non-Residential) Tier 2 - Low sloped roofing, a minimum 3 Year Aged SRI 78

LEED and Green Globes are voluntary green building certification systems with completion of certification based on an accumulation of points to achieve a given threshold. IgCC and CalGreen are green building codes which are adopted in part or in whole (by State Agencies, Counties and Municipalities, etc.) and is used as a mandatory minimum level of construction, not an achieved level of compliance. Based on LEED V4 and CalGreen Voluntary Tier 1, the 3 Year Aged SRI of 64 is closer to a current "parity" with other codes/certifications systems than the Voluntary Tier 2 level of CalGreen which the proponent used.

The second item which the proponent addressed in their proposal for advancing the SRI threshold was one of energy savings. The proponent used a simple algebraic equation given to them by LBNL (Lawrence Berkeley National Laboratory). However, energy calculations are based on many factors, including building occupancy, geographic location, building orientation, level of roof insulation, etc.

Using the DOE's (Department of Energy) Roof Savings Calculator (<http://rsc.ornl.gov/>) with an office occupancy, and levels of insulation required by IgCC 2012, a comparison was made of several cities in Climate Zones 1 through 3 comparing a solar reflectance of 0.55 with the proposed increase to 0.65 (and the thermal emittance of 0.75). See Table Below {{Cool Roofs Aged SRI CZone 1 thru 3.pdf}}

City	State	Zone	Cooling Savings	Heating Savings	Net Savings Using 0.65	Savings per SF	Gas in \$/Mmbtu	Elec in cents/K wh	Avg Yearly Snowfall (DEC-MAR)	Avg High Temp (DEC-MAR)	Degrees Above Freezing	Avg Snowy Days
Columbia	SC	3A	\$ 77.00	\$ (135.00)	\$ (58.00)	\$ (0.00)	9.65	10.22	1.5"	60.6 F	28.6 F	1
Atlanta	GA	3A	\$ 99.00	\$ (154.00)	\$ (55.00)	\$ (0.00)	10.3	10.44	2.9"	56.87 F	24.87 F	2.1
Birmingham	AL	3A	\$ 99.00	\$ (181.00)	\$ (82.00)	\$ (0.00)	12.15	10.77	1.6"	53.8 F	21.8 F	0.8
Los Angeles	CA	3B	\$ 143.00	\$ (94.00)	\$ 49.00	\$ 0.00	9.04	13.40	0"	68.67 F	36.67 F	0
San Diego	CA	3B	\$ 155.00	\$ (65.00)	\$ 90.00	\$ 0.00	9.04	13.40	0"	65.1 F	33.1 F	0
San Francisco	CA	3C	\$ 6.00	\$ (60.00)	\$ (54.00)	\$ (0.00)	9.04	13.40	0"	59.0 F	27.0 F	0
Houston	TX	2A	\$ 73.00	\$ (81.00)	\$ (8.00)	\$ (0.00)	8.86	8.12	0"	66.62 F	34.62 F	0
New Orleans	LA	2A	\$ 87.00	\$ (93.00)	\$ (6.00)	\$ (0.00)	9.23	9.13	0"	65.92 F	33.92 F	0
Phoenix	AZ	2B	\$ 125.00	\$ (93.00)	\$ 32.00	\$ 0.00	9.72	9.42	0"	70.2 F	38.2 F	0
Ft Lauderdale	FL	1A	\$ 136.00	\$ (12.00)	\$ 124.00	\$ 0.01	11.9	9.99	0"	76.87 F	44.87 F	0
Key West	FL	1A	\$ 129.00	\$ (3.00)	\$ 126.00	\$ 0.01	11.9	9.99	0"	76.13 F	44.12 F	0

BASIS OF DESIGN: 20,000 SF Office Building with R-20 (CZ 1) or R-25 (CZ 2-3) Insulation and using Minimum Aged Solar Reflectance Index of .55 and .65. , Avg Efficiency A/C and Gas Furnace and current Electric/Gas Prices from EIA April 2014. Roof Savings Calculator was used for these calculations. (Note CZ 3 and CZ 4 are under review, but CZ 1 and CZ 2 are not.)

NOTE: Included in the table are also the snow and snow accumulation of each city as LBNL, the lab cited by the proponent, does not include a heating penalty in their studies for the use of reflective roofs because they state that during the winter, roofs are covered in snow and a darker material would provide no benefit as the roof is under snow cover. Climate Zones 1 through 3 do not receive enough snow to hamper a darker roof from keeping the roof warmer in the winter than a highly reflective roof.

As seen in the Table, there is a slight savings in Climate Zone 1 but there is no appreciable savings in Climate Zone 2 or 3. Rounding to the nearest cent per square foot shows most of the table at a zero savings due to the size of the building.

The increased solar reflectance (0.65) and SRI (78) in the original proposal does not meet "parity" with leading green codes and does not provide the 29% energy savings, as stated in their proposal.

Modifying the numbers (3 Year Aged SRI to 64 and Aged Solar Reflectance to 0.575)will align IgCC with LEED V4 and Voluntary CalGreen Tier 1 and EXCEED Green Globes 2013 and the standard CalGreen 2013 minimum mandatory levels.

Public Comment 3:

Jason Wilen, representing National Roofing Contractors Association requests Disapprove.

Commenter's Reason: Disapproval of GG166-14 is consistent with the IgCC Energy and Water Committee disapproval of GEW82-14. The proponent's reason statement lists two reasons why GG166-14 should be approved: to generate 30 percent additional energy savings and to be consistent with the requirements of CalGreen Tier 2. GG166-14 should be disapproved because the proposed change does not achieve either of the purported benefits.

Regarding energy savings:

The proponent cites Lawrence Berkeley National Laboratory (LBNL) research as the basis of their 30% energy savings claim. LBNL studies are based on buildings with roof R-values substantially less than the minimum required in IECC or IgCC, therefore not an appropriate predictor of energy savings for buildings with minimum required roof insulation in IECC or IgCC. This is because as roof R-values increase, the potential cost savings due to reflective roofing decreases (especially in more northerly climate zones).

Regarding consistency with CalGreen Tier 2:

The reflectance and emittance values used by the proponent are from CalGreen 2013 Tier 2 for High-rise Residential Buildings, Hotels and Motels. However, the proposed change in IgCC Table 408.3.1—REFLECTANCE AND EMITTANCE effects all building types within the scope of IgCC, not just High-rise Residential Buildings, Hotels and Motels.

GG166-14

GG168-14

408.3.1, Table 408.3.1, 408.3.1.1, 408.3.1.2, 408.3.1.3 (New)

Proposed Change as Submitted

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 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There are issues with this code change as submitted that should be corrected in the public comment period.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Amy Dickie, representing Global Cool Cities Alliance (amy@globalcoolcities.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

408.3.1.1 Roof products testing. Roof products shall be tested for 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. 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, labeled, and ~~labeled-certified by the manufacturer demonstrating compliance~~ certified.

Commenter's Reason: We are proposing this modification in response to testimony and an attempted floor modification by John Taecker from UL.

Public Comment 2:

Mike Fischer, ARMA, representing The Asphalt Roofing Manufacturers Association (mfischer@kellenccompany.com) requests Disapprove.

Commenter's Reason: The proposal carries forward criteria from certification protocols into the IgCC that are not part of the base IECC. The proposal would restrict options for demonstrating compliance to the intent of the code by use of the term "nationally recognized" instead of the word "approved".

GG168-14

GG169-14

408.3.1.1, Chapter 12

Proposed Change as Submitted

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 C1371 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The certification and testing language should be in certification documents, not in the code. This proposal overcomplicates the code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Bob Zabcik, NCI Group, Inc., Houston, Texas, representing Cool Metal Roofing Coalition (bobz@ncilp.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 aged, listed and labeled and certified by the manufacturer demonstrating through a nationally recognized third-party listing program to demonstrate compliance.

Commenter's Reason: Summary: This proposal addresses the fact that the IgCC allows manufacturers to self-certify roof radiative properties and does not reference a de facto aging standard, only test standards, which allows gamesmanship with cool roof products that aren't registered through CRRC or similar 3rd party program.

Currently, the IgCC requires accredited laboratory testing of Solar Reflectance and Thermal Emittance in Section 408.3.1. However, there are no definite third-party listing requirements for tested products and there are no aging requirements outside of the words "three-year aged" used in Section 408.3.1.1. Therefore, a manufacturer could literally age a sample in a closet for three years, send it to an accredited lab to be tested as an aged product, then label that product themselves with the results and still be in compliance with the IgCC.

The original proposal fixed this problem and ensured a base level of compliance with respect to aged properties by adding detail describing the aging process without naming a specific program. In particular, the proposal was ensuring that the aging process matched CRRC-1's broad requirements for aging on accredited aging sites in three separate climates. The proposal was disapproved because the committee felt that the proposed language overly complicated the code. The proponent respectfully disagrees with the committee in that regard. The committee also stated that these concerns should be addressed in the certification documents. However, if a manufacturer was to self-certify as currently allowed by Section 408.3.1, that clearly would not be the case.

The problem described above is significant. The new proposed language addresses this concern in a more direct and simpler fashion by requiring not just testing of samples at a nationally accredited lab but also aging, listing and labeling roof products to a nationally recognized third-party listing program. This is precisely the purpose of the CRRC-1 standard even though this proposal does not require the CRRC program specifically. The only other nationally recognized program, Energy Star, will start requiring aging at three different climate sites as well starting July 1st, 2017 but will likely grandfather in existing products.

Public Comment 2:

Mike Fischer, ARMA, representing The Asphalt Roofing Manufacturers Association (mfischer@kellenccompany.com) requests Disapprove.

Commenter's Reason: The proposal carries forward criteria from certification protocols into the IgCC that are not part of the base IECC. The proposal would restrict options for demonstrating compliance to the intent of the code by use of the term "nationally recognized" instead of the word "approved". Additionally, the proponent assumes that the aging protocols and options in CRRC-1 should apply in all regions across all countries. The IgCC and IECC are International Codes; there may be jurisdictions where the selection of all climates cited in CRRC-1 is neither appropriate nor necessary.

GG169-14

GG170-14

408.3.2

Proposed Change as Submitted

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 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 foliation 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Paragraph 1.4 goes too far to make this code section much too complicated for enforcement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Susan Gitlin, representing US Environmental Protection Agency (gitlin.susan@epa.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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. *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; and
 - 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.

Commenter's Reason: The Committee found that paragraph 1.4 was too onerous, so this modification deletes that provision.

Public Comment 2:

Greg Johnson, representing self (gjohnsonconsulting@gmail.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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. *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; and
 - 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.

Commenter's Reason: The only reason that the committee provided for disapproval of this proposal was that "Paragraph 1.4 goes too far to make this code section much too complicated for enforcement."

This public comment strikes the only portion of paragraph 1.4 that has any degree of complexity. The remaining sentence of 1.4 provides simple guidance to the designer regarding treatment of overlapping areas of vegetation.

The original proposal provides much needed relief from excessive stringency requirements for foliage coverage on vegetated roofs. With this modification the code will be more practical and easier to use.

Public Comment 3:

Hope Medina, representing self (hmedina@coloradocode.net) requests Approve as Modified by this Public Comment.

Modify the proposal 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. *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; and
 - 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.

Commenter's Reason: The committee felt that Section 1.4 went too far, so this comment is to remove the section.
The original proposal improves the usability of this section, and helps to remove the confusion on how to apply this section.

GG170-14

GG176-14

409.1.1, Table 409.1.1

Proposed Change as Submitted

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	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>
2	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>
3	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>
4	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 approved by the code official</u>

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language is a needed improvement to better align the light pollution requirements of the IgCC with the IES/IDA Model Lighting Ordinance that was used as the original basis for development of this section.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jonathan Siu, City of Seattle, Dept of Planning & Development, representing Washington Association of Building Officials Technical Code Development Committee (jon.siu@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

409.1.1 Exterior lighting Light pollution zones. The ~~lighting~~ light pollution 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**

<u>LIGHTING LIGHT POLLUTION ZONE</u>	DESCRIPTION
4 A	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.
2 B	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.
3-C	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.
4 D	Areas such as, but not limited to, high-density entertainment districts and heavy industrial areas, where <i>approved</i> by the <i>code official</i>

409.2 Uplight. Exterior lighting shall comply with the requirements of Table 409.2 for the ~~exterior lighting~~ light pollution zones (LZ LPZ) appropriate to the building site.

Exception: Lighting used for the following exterior applications shall be exempt from the requirements of Table 409.2:

1. Lighting for building facades, landscape features, and public monuments in ~~exterior lighting zones 3~~ light pollution zones C and 4 D.
2. Lighting for building facades in exterior ~~lighting~~ light pollution zone 2B.

TABLE 409.2
UPLIGHT RATINGS^{a, b}

Maximum Luminaire Uplight Rating	LIGHTING LIGHT POLLUTION ZONE (LZ LPZ)			
	1 <u>A</u>	2 <u>B</u>	3 <u>C</u>	4 <u>D</u>
	U1	U2	U3	U4

- a. Uplight ratings (U) are defined by IESNA TM-15-07 Addendum A.
b. The rating shall be determined by the actual photometric geometry in the specified mounting orientation.

409.3 Light trespass and glare. Where luminaires are mounted on buildings with their backlight oriented towards the building, such luminaires shall not exceed the applicable glare ratings specified in Table 409.3(1). Other exterior luminaires shall not exceed the applicable backlight and glare ratings specified in Table 409.3(2).

TABLE 409.3(1)
MAXIMUM GLARE RATINGS FOR BUILDING MOUNTED
LUMINAIRES WITH THE BACKLIGHT ORIENTED TOWARDS THE
BUILDING^{a, b}

HORIZONTAL DISTANCE TO LIGHTING BOUNDARY (H_{LB})	LIGHTING LIGHT POLLUTION ZONE (LZ LPZ)			
	1 <u>A</u>	2 <u>B</u>	3 <u>C</u>	4 <u>D</u>
$H_{LB} > 2h_m$	G1	G2	G3	G4
$h_m < H_{LB} \leq 2 h_m$	G0	G1	G1	G2
$0.5 h_m \leq H_{LB} \leq h_m$	G0	G0	G1	G1
$H_{LB} < 0.5 h_m$	G0	G0	G0	G1

h_m = Mounting height: The distance above finished grade at which a luminaire is mounted, measured to the midpoint of the luminaire.

- a. Glare (G) ratings are defined by IESNA TM-15-07 Addendum A.
b. The rating shall be determined by the actual photometric geometry in the specified mounting orientation.

TABLE 409.3(2)
MAXIMUM ALLOWABLE BACKLIGHT AND GLARE RATINGS^{a, b, c}

HORIZONTAL DISTANCE TO LIGHTING BOUNDARY (H_{LB})	LIGHTING LIGHT POLLUTION ZONE (LZ LPZ)			
	1 <u>A</u>	2 <u>B</u>	3 <u>C</u>	4 <u>D</u>
$H_{LB} > 2h_m$	B3	B4	B5	B5
	G1	G2	G3	G4
$h_m < H_{LB} \leq 2 h_m$	B2	B3	B4	B4
	G1	G2	G3	G4
$0.5 h_m \leq H_{LB} \leq h_m$	B1	B2	B3	B3
	G1	G2	G3	G4
$H_{LB} < 0.5 h_m$	B0	B0	B1	B2
	G1	G2	G3	G4

h_m = Mounting height: The distance above finished grade at which a luminaire is mounted, measured to the midpoint of the luminaire.

- a. Backlight (B) and glare (G) ratings are defined by IESNA TM-15-07 Addendum A.
b. Luminaires located two mounting heights or less from the *lighting boundary* shall be installed with backlight towards the nearest *lighting boundary*, unless lighting a roadway, bikeway or walkway that intersects a public roadway.
c. The rating shall be determined by the actual photometric geometry in the specified mounting orientation.

Commenter's Reason: This public comment makes editorial modifications to Section 409 on light pollution. The modifications make the text and tables more closely align with the topic of this section, and avoid conflict and confusion with the IECC.

It is recognized that the code change proposal approved by the Committee does not create a technical problem because the reason for regulating lighting zones is different in the IgCC and the IECC (light pollution versus efficient use of energy). However, for jurisdictions who adopt both the current IECC and IgCC, creating exterior lighting zones in the IgCC that have different parameters from the identically-named zones in the IECC will lead to confusion regarding which "exterior lighting zone" is being referred to. This public comment simply renames the zones in the IgCC to "light pollution zones" (LPZ, as opposed to LZ) and redesignates them as zones A through D. This new terminology avoids the issue of confusion with the IECC exterior lighting zones, and directly connects these zones in the IgCC with the issue Section 409 is addressing.

The changes to the text and tables in Sections 409.2 and 409.3 carry the editorial changes through to align these sections with the new terminology. Based on a word search in the IgCC, these sections contain the only code provisions affecting exterior lighting (light pollution) zones.

If the intent is to change the exterior lighting zone parameters in both the IECC and the IgCC, that change should be proposed for both codes in the 2018 cycle, so the codes can remain coordinated for the 2015 codes.

GG176-14

GG184-14

202 (New), 503.1

Proposed Change as Submitted

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.

BIBLIOGRAPHY:

1. CHARACTERIZATION OF BUILDING-RELATED CONSTRUCTION AND DEMOLITION DEBRIS IN THE UNITED STATES, Prepared for The U.S. Environmental Protection Agency, Office of Solid Waste, Report No. EPA530-R-98-010, by Franklin Associates, Prairie Village, KS.
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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There is uncertainty on how the specified size credit would be applied. The differences in the definition having structural member and the application of 503.1 needs to be resolved in a public comment.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Thomas Culp, Birch Point Consulting LLC, on behalf of the Aluminum Extruders Council, representing Birch Point Consulting LLC representing the Aluminum Extruders Council (culp@birchpointconsulting.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

Manufactured to size. A structural member or envelope component 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.

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~~ members or envelope components 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.

Commenter's Reason: This proposal recognizes the benefit of pre-engineered and pre-sized materials to reducing waste during the construction phase and encourage more efficient control of waste and recycling at the manufacturing site. However, this benefit is true not just for structural members, but also for other envelope components such as pre-engineered unitized curtain wall, cladding panels, etc. Therefore, this modification clarifies that this provision applies to both structural members and envelope components that are manufactured to size. This modification also addresses the committee's comment to make the language in the definition and section 503.1 consistent.

We ask that you vote against the initial motion for disapproval, and then vote for approval as modified by this public comment.

Public Comment 2:

Mark Nowak, representing Steel Framing Alliance requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

Manufactured to size. A structural member Structural materials that does do not produce waste at the construction site or excess material at the point of manufacturing by being manufactured to the size specified for installation.

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.

Bibliography:

1. CHARACTERIZATION OF BUILDING-RELATED CONSTRUCTION AND DEMOLITION DEBRIS IN THE UNITED STATES
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.

Commenter's Reason: Materials used to frame a building constitute over 20% of construction waste for non-residential buildings 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 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 the size specified for installation 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.

During the first hearing, comments were raised that the text and definition for "manufactured to size" were not completely in agreement. This public comment modifies the text and definition to bring them into agreement.

GG184-14

GG185-14

503.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended this proposal be disapproved because the term "unit" is not adequately defined. Otherwise this is a good proposal. The committee recommended that work be done in the public comment period to improve the proposal.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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 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 by both.
~~one of the following methods:~~
 - 3.1. ~~Weight~~
 - 3.2. ~~Volume~~
 - 3.3. ~~Unit~~
4. Receipts or other documentation related to 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.

Commenter's Reason: This public comment resolves the concern expressed at the IgCC Hearings Memphis. Although unit may be an appropriate term for quantifying an amount of certain salvaged materials, for other materials this may create confusion. Therefore "unit" has been removed from the list of calculations in item #3.

GG185-14

GG187-14

503.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that a limitation on distance to a disposal site is needed for the reasons stated. The limitation of having a disposal site within 75 miles seems reasonable.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Martha VanGeem, representing self; Emily Lorenz, representing self (emilyblorenz@gmail.com) request Approve as Modified by this Public Comment.

Modify the proposal 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. Where the nonhazardous construction waste contains at least 1000 lbs of metals and the distance to the available salvage and recycling facilities from the building site is more than 75 miles, not less than 50% of the nonhazardous metals shall be diverted from disposal and a Construction Material and Waste Management Plan shall be developed and implemented. 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.

Commenter's Reason: This public comment requires diversion from landfill of at least 50% of metals regardless of the distance to recycling and salvage facilities if the amount of metals in the waste is more than 1000 lbs. Metals such as steel, copper, and aluminum should always be recycled. The process to mine ore and process it to produce steel, copper, and aluminum has a significant environmental footprint. The energy used to transport these materials is small relative to the energy used to extract virgin materials and produce metals. These materials are commonly recycled and the manufacturers of these materials depend on recycled materials as part of their supply chain.

The original proposal changed the criteria for recycling from a requirement regardless of distance to recycling facilities, to only being required if recycling facilities are within 75 miles, regardless of the type of recycling facility.

<http://www.steel.org/Sustainability/Steel%20Recycling.aspx>

http://www.copper.org/publications/newsletters/innovations/1998/06/recycle_overview.html

<http://www.benefits-of-recycling.com/aluminumrecyclingprices/>

Public Comment 2:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Disapprove.

Commenter's Reason: We are asking for disapproval. The reason statement, and subsequent committee reason statement, fails to address other issues which are equally relevant to assessing waste options.

Point #1: Diesel exhaust as the primary reason for modifying this provision is only relevant if all waste hauling vehicles operate by using diesel. They do not. They also run on gasoline.

Point #2: The first sentence of Section 503.1 requires that 50% of materials be diverted, no matter how far said waste, salvage or recycling facilities are located. The second sentence then exempts any waste plan if said facility is in excess of 75 miles away from the project site. The end result is a conflict between the first and second sentence.

Point #3: Distance recommended is arbitrary and fails to address the issue of environmental protection by diverting the waste from landfills. Restricting the distance only reduces the effectiveness of the other recycling provisions in this code.

Point #4: If the issue is urban versus suburban versus rural regions, then it will be up to the authority having jurisdiction to make that determination.

GG187-14

GG188-14

503.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved because it does not add clarity or enhance the code. It may be a good idea, but the language is confusing.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Martha VanGeem, representing self; Emily Lorenz, representing self (emilyblorenz@gmail.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 on-site construction waste generated shall not exceed 2.5 lbs per ft² of building floor area for new ~~building projects~~ buildings on sites with less than 5 percent existing buildings, structures, ~~or landscape~~ and hardscape. 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.~~
54. 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.

Commenter's Reason: This modification clarifies the text and some of the confusing language has been removed. The committee was in favor of this concept and this modification provides clarification in response to their comments.

This proposed requirement is only for new buildings on sites with very little previous built material (5 percent existing buildings, structures, and hardscape). This means that there won't be much, if any, construction and demolition waste from existing structures or hardscape.

Additional reasoning is provided in the original reasoning statement.

GG188-14

GG189-14

Table 302.1, 503.2 (New)

Proposed Change as Submitted

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**

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%	
<u>503.2</u>	<u>Resilient design and construction</u>	<input type="checkbox"/> <u>Yes</u>	<input type="checkbox"/> <u>No</u>

(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 [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. 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This is an admirable idea and needs to be addressed. Resiliency is within the domain of the green code and should be considered in the future. However, the life cycle assessment changes and the lack of metrics and definitions to support the proposal are troubling.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Tien Peng, NRMCA, representing National Ready Mixed Concrete Association (tpeng@nrmca.org) requests Approve as Modified by this Public Comment

Replace the proposal as follows:

503.2 Resilient Design and Construction Where this section is indicated to be applicable in Table 302.1, public safety and disaster resilience shall be improved by designing the project building to resist hazards above the minimum requirements in the

International Building Code, including resistance to floods, hurricanes and earthquakes, in order to reduce the environmental impacts associated with extracting, processing, transporting and installing materials for repairing, replacing and retrofitting buildings after a disaster. Compliance with this section shall be determined in accordance with all of the following:

1. Reduced environmental impacts from disaster resilient design for natural hazards shall be demonstrated through whole-building life cycle assessment of the project building. To meet the requirement, two building designs shall be completed, a reference building and a 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 of the International Building Code and the project building shall be designed to a higher level of loads and hazards.
2. The whole building life cycle assessment shall be in accordance with Section 303 with the exception that 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 impact measures under Section 303.1, as compared to a reference design.
3. The damage to the buildings for repairing, replacing and retrofitting the buildings shall be estimated by using an approved methodology for estimating potential losses from disasters. The potential loss estimates analyzed in the life cycle assessment shall include the physical damage to residential and commercial buildings, schools, critical facilities and infrastructure.
4. The environmental impact shall be calculated in accordance with whole building life cycle assessment and shall take into account the probability of the buildings being subjected to project building loads and hazards over a 60-year life of the buildings.
5. The life cycle assessment shall conform to the requirements of ISO 14044.

Commenter's Reason: The General Code Committee considered this proposal as "an admirable idea and needs to be addressed" and that "Resiliency is within the domain of the green code and should be considered in the future. However, the life cycle assessment changes and the lack of metrics and definitions to support the proposal are troubling."

The Public Comment proposed code revision to GG189-14 (1) is restructured and references the existing provisions of the whole building life cycle assessment in the IgCC Section 303.1; and (2) provides an easily accessible metric via the FEMA Hazus software; and (3) maintains its selection as a jurisdictional elective.

Item 2 was intended to reference using the Federal Emergency Management Agency's (FEMA's) Methodology for Estimating Potential Losses from Disasters or other approved methodology by building official. However, as new guidelines and standards are not allowed to be introduced in the public comment period, a generic reference to "an approved methodology for estimating potential losses from disasters" was made instead. The intended guidelines can be included in the commentary to the IgCC.

Therefore, I ask the code voting body to APPROVE AS MODIFIED PER THIS PUBLIC COMMENT to GG189-14

GG189-14

GG191-14

505.1 (New), 505.2 (New), 505.2.1 (New), 505.3 (New), 505 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved because the proposed information belongs in a different document or code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Julius Ballanco, representing self (JBENGINEER@aol.com) requests Approve as Submitted.

Commenter's Reason: The justification for not accepting this change is that it belongs in a different document or code. The proposed text is green. This is the Green Construction Code. The proposed requirement relates to green installation that allow the building to operate green. The Scope of the code, found in Section 101.3, indicates that the code addresses design, construction, and maintenance among other items. Handling food waste is a part of the design, construction, and maintenance of the building.

Section 503.1 requires diversion of construction waste. Section 504.1 requires recycling post certificate of occupancy. These two similar requirements clearly indicate that food waste management belongs in the same chapter. Diversion of food waste from landfills is as important as diversion of construction waste and post certificate of occupancy recycling. With a half a pound of food waste per person each day, this amounts to more than 78,000 tons a day of food waste.

When food waste is hauled to landfills, there is a creation of green house gases, plus there is a source of energy that is not used. Beneficial reuse of food waste is the green alternative to filling landfills with food waste. This proposed change provides all of the green alternative to diverting food waste to a landfill.

GG191-14

GG 192-14

202 (New), 505, 505.1, 505.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: While this is an aspirational code, this proposal perhaps takes us too far down the road. It is inconsistent with previous committee actions and cuts too deep by eliminating some of the single attribute categories that have been retained by the

committee's prior actions. This exempts buildings under 10,000 square feet and does not provide for an exception for electrical, plumbing and mechanical equipment. If 55 percent is too easy to comply with, higher percentages and other options to strengthen the provisions might be considered, and jurisdictions always have the option to do that upon adoption.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Craig Conner, representing self (craig.conner@mac.com); Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net); Gary Klein, Affiliated International Management, LLC, representing self request Approve as Submitted.

Commenter's Reason: GG192 AS offers a usable way to provide information on product and material environmental impact. Providing the information in EPDs (environmental product declarations) encourages designers to choose a more environmentally sound product.

GG192 eliminates the "busy work" of the existing Section 505. The existing section is hard to fail. Wood almost by definition will be "bio-based" (Section 505.2.4 #1). The whole steel market is heavily recycled so steel will be recycled (Section 505.2.2). Concrete will be indigenous (local) because the sand and rock aggregate are local, and surely from less than 500 miles away (Section 505.2.5). Wood, steel and concrete are good materials, but why do we need a calculation to show that wood, steel and concrete will make up most of a conventional building? GG192 eliminates a useless calculation.

GG192 is preferable to the approved GG194, which makes the existing section more complicated by adding a multiplier. GG192 is preferable to the approved GG212, which adds nine more standards to a green code that is already too complicated. Please support GG192 AS.

Public Comment 2:

Matthew Dobson, Vinyl Siding Institute, representing Vinyl Siding Institute (mdobson@vinylsiding.org) requests Approve as Submitted.

Commenter's Reason: This change is necessary as the current language in the code provides no realistic incentives or goals. Most materials on the market can qualify to one of the provided criteria. Having the baseline of LCA and Environmental Product Declarations will propel industry in the right direction of using science and fact based tools for material evaluation.

Public Comment 3:

Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net) requests Approve as Modified by this Public Comment.

Replace the proposal 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.

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.

505.3 Building material and 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.

Commenter's Reason: We would like to encourage designers to use Environmental Product Declarations (EPD) in designing a green project. We understand that EPDs have been required in other countries from manufacturers of their products for sustainability, and that we need to catch up. We also understand that code officials like having options. We took the best code proposal for Environmental Product Declarations, and added back in the sections on the types of materials required to be used for compliance with Section 505.2.

GG192-14

GG194-14

202 (New), 505.2, 505.2.6 (New), 505.2.6.1 (New)

Proposed Change as Submitted

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.

GG194-14 : 505.2 #1-COATS733

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason:

The proposal provides good criteria for fully understanding a product's impact on the environment.

Assembly Motion:

Disapproved

Online Vote Results:

Failed - Support: 43.21% (70) Oppose: 56.79% (92).

Assembly Action:

None

Analysis: For staff analysis of the content of ISO 14025:2006, 14040:2006 and 21930:2007 relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

The following is additional information that was not posted to the ICC website:

Standard 21930:2007 was received and reviewed by ICC Staff after the ICC website posting of staff analysis of standards. The standard contains language that could affect enforceability. See Section 5.

Individual Consideration Agenda

Public Comment 1:

Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org) requests Approve as Submitted.

Commenter's Reason: This proposal requires compliance with the current material selection requirements based on their merit, while giving additional credit when the materials chosen are accompanied by Environmental Product Declarations (EPDs). All other proposals introducing EPDs attempt to give credit for having an EPD regardless of what the EPD says, releasing materials from any mandatory environmentally friendly attributes, in exchange for simple transparency about those materials. The other proposals do this by making EPDs a stand-alone alternative to complying with current materials requirements.

The "production stage" of the life cycle for building materials is equivalent to the phrase "cradle-to-gate," so the required application is clear. Sections 5.5 and 6.1 of the referenced standard ISO 21930 splits the entire life cycle for materials ("cradle-to-grave") into four life cycle stages, the first of which is the production stage, or "cradle-to-gate." Cradle-to-gate is described in those sections as the production stage from raw material supply, transport to the manufacturing site, manufacturing of the product, and all processes prior to transport of the product to the building site. ISO 21930 sets the production phase (cradle-to-gate) as a mandatory minimum, but allows for other life cycle phases to be included. This proposal is worded to also allow for other life cycle phases to be utilized in the development of an EPD. The choice of production phase, also known as cradle-to-gate, was to correlate this minimum in the IgCC with the minimum in the referenced standard.

Public Comment 2:

Julie Ruth, representing American Architectural Manufacturers Association (julruth@aol.com) requests Approve as Modified by this Public Comment.

Modify as Follows:

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 that also comply with Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5 shall be multiplied by 1.5. Where a material complies with more than one section, the material value shall be multiplied by 1.5 times the number of sections that it complies with.

Commenter's Reason: This proposal clarifies what appears to be the intent of the original proposal. This is, specifically, that the multiplier of 1.5 for products with EPDs is only to be used on materials that also comply with at least one of the original subsections of 505.2 (i.e. Section 505.2.1, 505.2.2, 505.2.3, 505.2.4 or 505.2.5.). Also, that if a product complies with more than one of the original subsections AND has an EPD, its material value is to be multiplied by 1.5 times the number of subsections it complies with. For example, if a material complies with two of the five original subsections AND has an EPD, its material value would be multiplied by a factor of 3.

Although a number of proposals to recognize materials with EPDs were submitted for consideration by the IgCC General Code Change Committee, GG194 was the only one that did not permit having an EPD to be used as a substitute for complying with at least one of the five original subsections. Instead, the proponents of GG194 argued that it gave recognition to the value of EPDs without treating having one as a substitute for other sustainable characteristics.

AAMA agrees that, as presented, giving additional weight to products with EPDs is appropriate. We do not agree, however, that the proposal as originally submitted and approved, provides the clarity needed to assure it will be applied in the manner indicated.

This Public Comment provides the clarity needed. We urge the approval of GG194 as modified by this Public Comment.

Public Comment 3:

Craig Conner, representing self (craig.conner@mac.com) requests Disapprove.

Commenter's Reason: GG194 makes the existing Section 505 more complicated by adding a multiplier. The existing section is hard fail. Wood will be "bio-based" (Section 505.2.4 #1). Steel will be recycled (Section 505.2.2). Concrete will be indigenous (local). Wood, steel and concrete are good materials, but why do we need a calculation to show that wood, steel and concrete will make up most of a conventional building?

Public Comment 4:

Jeff Inks, representing WDMA (jinks@wdma.com) requests Disapprove.

Commenter's Reason: While we are supportive of awarding additional credit for building materials with environmental product declarations, we believe this proposal is unacceptably flawed in several respects and urge disapproval of it. First, we believe that for purposes of providing additional credit for environmental product declarations, the bar needs to be set at a minimum Type III EPD which more comprehensively meets the intent and value of encouraging such declarations, which also makes them much more meaningful. Second, this provision discriminates against products that do have environmental product declarations of some type, especially those with Type III declarations, but that may not meet one or more of the other requirements of Section 505.2. A product meeting the provisions of Section 505.2 as proposed does not necessarily mean it is a more environmentally preferable product than other materials that do not but that do have an EPD, especially those with Type III EPD's, and even more so, those with a cradle to grave Type III EPD. The proposal actually devalues environmental product declarations, especially Type III. Third, raising the minimum percentage of building materials that must meet the requirements of Section 505 is very arbitrary. No adequate substantiation has been presented to justify the 20% increase or to assess or determine what the impact of such an increase will have on the availability of compliant materials. GG-212 which was also approved at the CAH provides a much better and more robust approach, in general, to incorporating EPD's into the IgCC. We again therefore request disapproval of GG-194.

Public Comment 5:

Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net); Craig Conner (craig.conner@mac.com) request Disapprove.

Commenter's Reason: The use of a multiplier adds unnecessary complications and will make this code unwieldy for code officials. Additionally, this complexity allows for a range of loopholes to achieve compliance without actually promoting green construction. For instance the use of the 1.5 multiplier for the use of EPDs means you will actually obtain 50%. Using a simpler system of a fixed 55% is clearer and achieves the same overall effect.

Public Comment 6:

Mark Nowak, representing Steel Framing Alliance requests Disapprove.

Commenter's Reason: Environmental product declarations (EPDs) are not appropriate for a building code. They are subjective in nature and do not indicate specific environmental impacts. They can be misleading indicators of sustainability. Further, they should not be used in place of objective and proven sustainability features as this proposal would permit. Nor should they arbitrarily be used to justify a theoretical increase in the value of a proven and measureable sustainability feature. There is no relationship between an EPD and the specific sustainability attributes now recognized in the code - allowing a factored increase in the existing attributes creates a theoretical benefit that does not exist.

In addition, most all major classes of products and manufacturers have an EPD. Giving credit for a document that already exists for most materials and that does not improve the building's performance or impact on the environment would take the IgCC backward. Further, it would degrade the value of materials that have strived to be more sustainable through high recycled content, recyclability, or by following harvesting methods that value the environment.

This proposal will have no net positive impact on a building's sustainability. It should be disapproved.

GG194-14

GG197-14

505.2, 505.2.6 (New)

Proposed Change as Submitted

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 StandardTM 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal is headed in the right direction, but is very limited in its application and should to be more neutral. This waters down the 55 percent figure. The concept is good, but it is misleading in its current form. More work needs to be done on Item 6 to eliminate confusion and prevent it from becoming a never-ending list.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Emily Lorenz, representing James Harding Buidling Products Inc. (emilyblorenz@gmail.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

505.2.6 Prefinished materials. ~~For categories listed in items 1 through 6 below~~ Prefinished materials include those materials with an interior finish, prefinished those material with exterior surfaces, or trim that are used for finishing applications. Prefinished materials shall be materials used for finishing not receive additional coatings or surface applications that do not require site-applied finishing during construction 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.~~

Commenter's Reason: To address the Committee's reason for disapproval at the Committe Action Hearings, this public comment was written to modify GG197 to be more neutral. This public comment also removes the list from GG197 and instead lists the attributes of prefinished materials.

It is preferable to prefinish materials in a factory, manufacturing facility, or other controlled facility for several reasons.

Prefinished materials:

1. do not contribute to site liquid waste. In a factory setting, waste is typically minimized and recycled.
2. minimize the potential exposure of construction worker and building occupants to pollutants on site during construction. This is due to EPA and OSHA requirements in factory settings.
3. eliminate the need to store large amounts of paint on site.
4. minimize waste due to quality-control measures that are more typical in factory settings.

Because the IgCC is an overlay code, the definitions for "interior finish," "exterior surfaces," and "trim" are the same as those that are included in the 2015 IBC:

1. Interior finish: Interior finishes includes interior wall and ceiling finish and interior floor finish.
2. Exterior surfaces: weather exposed surfaces
3. Trim: Picture molds, chair rails, baseboards, handrails, door and window frames, and similar decorative or protective materials used in fixed applications.

Public Comment 2:

Timothy Serie, American Coatings Association, representing ACA (tserie@paint.org) requests Disapprove.

Commenter's Reason: The American Coatings Association (ACA) supports the Committee's disapproval of GG 197. ACA would like to note that our members make coatings that are applied on site and coatings applied to prefabricated building materials, both of which are the subject of this proposal.

We oppose this proposal since it creates a mandatory prescriptive requirement that arbitrarily favors certain building materials over others without a demonstrated environmental or human health benefit. This proposal assumes that prefinished materials are more durable, and thus more sustainable, than materials which require site-applied finishes. This may be true in some building assembly scenarios. However, it may be patently false with regards to other building materials. In particular situations, site-applied finishes may protect long-lasting materials from significant impairment or degradation as opposed to prefinished materials that have a limited lifespan. This proposal would create a narrow, one-size-fits-all approach that fails to consider the holistic, life-cycle impacts of the entire assemblies for walls, floors, and ceilings. Note that ACA supported the proposals to incorporate life-cycle analysis and environmental product declarations for building materials during the April/May 2014 IgCC hearings.

In addition, the proponent's argument that the proposal will minimize potential exposure to volatile organic compounds (VOC) during construction is already addressed in IgCC sections 806.2 and 806.3. These sections limit the VOC content in site-applied finishes such as paint, coatings, adhesives, and sealants. Any additional concerns about VOC emissions should be addressed in the appropriate sections of the IgCC.

Ultimately, this provision would reduce the flexibility of the system and create unintended consequences by adding another layer of rigid, prescriptive requirements. The proposal would discourage the use of materials like concrete, stucco, brick, and even some forms of siding that require site-applied finishes. Projects should be free to select the best product for a building based on

performance, durability, and life cycle environmental impacts, and should not be unnecessarily constrained by arbitrary code provisions. For these reasons, we ask the Committee to disapprove this proposal.

GG197-14

GG200-14

505.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The Committee wants to keep the language consistent with similar sections of the IgCC and retain the flexibility to choose different methods of measuring materials.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) requests Approve as Submitted.

Commenter's Reason: The Committee said they disapproved this proposal because they wanted to keep the language consistent with similar sections of the IgCC and retain the flexibility to choose different methods of measuring materials. However, this proposal does not reduce flexibility and, by replacing the term “mass” with “weight,” it eliminates any confusion as to how mass might be calculated. This also coordinates with related language in Sections 806.2 and 806.3.

This comment 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>.

GG200-14

GG202-14

505.2, 505.2.1, 505.2.2, 505.2.3, 505.2.4, 505.2.5, 505.2.6 (New)

Proposed Change as Submitted

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 ISO 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.

GG202-14 : 505.2-WOESTMAN1048

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The Committee prefers the percentage or sliding scale as a metric versus the arbitrary threshold that has been suggested as a new basis of measurement.

Assembly Action:

None

Analysis: For staff analysis of the content of CAN/CSA-ISO 14025:07(R2012) and ISO 21930:2007 relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

John Woestman, representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com) requests Approve as Modified by this Public Comment.

Replace the proposal as follows:

SECTION 202 DEFINITIONS

TYPE III ENVIRONMENTAL PRODUCT DECLARATION. A third-party certified report composed of product or material environmental impact based on a Life Cycle Assessment (LCA).

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, ~~505.2.5~~, or ~~505.2.5~~ 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.

505.2.3 Building materials and products with a Type III Environmental Product Declaration. The *Type III Environmental Product Declaration (EPD)*, based on an externally verified Life Cycle Assessment conducted in accordance with ISO 14044, 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

Commenter's 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 benefit of capturing the environmental impacts across allphases of a product life cycle. The requirement for a Type III EPD insures that the report has been independently reviewed by a third party for compliance with recognized standards.

Single attributes, such as recycled content, concede a reduced environmental impact by the manufacturer within a small segment of the overall product life cycle, without providing any information about the remaining raw materials or energy used to produce that product. The addition of EPDs as an additional factor of material selection acknowledges that an informed building owner, architect or designer will make choices that reduce environmental impacts, much the same as a comprehensive food label empowers a consumer to select healthier foods.

EPDs should be recognized for all materials and not limited to products that meet the individual attributes. This proposal expands the material selection requirements to recognize all manufacturers who have properly disclosed their environmental impacts.

CAN/CSA-ISO 14025 is the reference standard for EPDs. ISO 21930 is a companion standard to ISO 14025. ISO 14044 is the referenced standard for Life cycle assessment and is currently in the 2012 IgCC.

GG202-14

GG206-14

505.2.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Deleting "National" from the language does not necessarily exclude national programs from application in this section. This proposal actually expands the recognition of national and local take-back programs.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Disapprove.

Commenter's Reason: We propose that this proposal be disapproved. The proposal creates an even greater disparity between recyclable building materials requirements and the closed loop take-back program option. While we appreciate the code development committee's suggestion to allow greater opportunities for smaller and/or regional closed loop take-back programs this modification also lessens the stringency of this part of the provision by allowing any manufacturer to claim a take-back program without any form of verification (e.g. National program versus non-specified). Combine this with the fact that there are no minimum quantities (or percentages) of materials makes this part of the take-back provision extremely weak.

In view of this reduction in stringency we recommend this proposal be disapproved.

GG206-14

GG208-14

505.2.4

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There are many desirable bio-based products that would not be encouraged if this proposal was approved.

Assembly Motion:

As Submitted

Online Vote Results:

Failed – Support: 29.71% (52) Oppose: 70.29% (123)

Assembly Action

None

Individual Consideration Agenda

Public Comment:

Mark Nowak, representing Steel Framing Alliance requests Approve as Submitted.

Commenter's Reason: The existing text at Section 505.2.4 would give credit toward the 55% materials requirement simply because a material is defined as a bio-based product. Conversely, all other materials need to meet or exceed minimum levels of performance related to specific sustainability attributes.

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 an agency of the Federal Government that has promotion of bio-based materials as part of its mission. Use of bio-based materials by themselves does not improve the sustainability of a building.

Reference to the USDA Standard or its rationale is inappropriate in this code. One Federal Agency'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 existing requirements for wood products used for framing and other applications in buildings.

GG208-14

GG209-14

505.2.5, A105.3

Proposed Change as Submitted

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

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The change from "and" to "or" is inappropriate. The "regional" aspect may have been more palatable if it was accompanied by a definition.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

505.2.5 Regional materials. Regional materials or components shall be composed of resources that are recovered, harvested, extracted or 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.

Commenter's Reason: We are requesting the proposal be approved as modified by only changing deleting the term "indigenous" and replacing it with "regional." Support was shown at the spring code hearing by the code development committee (See committee reason statement) and others who testified in support of a change in terminology based on the proponent's reason statement (See above) demonstrating that by definition the term "regional" is a more accurate term for this provision.

GG209-14

GG210-14

505.2.5

Proposed Change as Submitted

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 harvested or 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved to be consistent with prior committee action on GG209-14. Adding the word "or" instead of "and" would add confusion.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

John Woestman, Kellen Company, representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

REGIONAL MATERIAL OR COMPONENT. A material or component that originates, is produced, is manufactured, grows naturally, or occurs naturally within a 500 mile (800 km) radius of the building site.

505.2.5 Indigenous Regional materials or components. Indigenous Regional materials or components shall be composed of resources materials or components that are recovered, harvested, extracted 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 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.

Commenter's Reason: Proposals GG210 and GG209 were very similar in intent. The committee disapproved GG210 based on their disapproval of GG209, stating that for GG209, "The "regional" aspect may have been more palatable if it was accompanied by a definition."

This Public Comment changes the word "indigeneous", which is NOT defined in the IgCC, to "regional". A definition for "Regional materials or components" from ICC-700 is provided.

It is important to remember that the original intent of this section was to encourage the use local materials or components, whether extracted or produced, thereby reducing the environmental effects of transportation.

This approach of "or" in place of "and" will bring consistency with Section 9.4.1.2 Regional Materials in ASHRAE 189.1, which is allowed as an alternative compliance path to the IgCC. Additionally, the term "or" is also used in ICC-700 and 2013 CalGreen.

If this Public Comment is not approved, in many jurisdictions, architects, designers, and contractors would potentially create one list of indigenous materials determined that are compliant with IgCC, and create yet another list of regional materials determined to be in compliance with the ICC-700, ASHRAE 189.1, and / or CALGreen;. These lists would differ based on the "and" and the "or". In some cases, users may confuse the two lists, and the code official will have to carefully examine the distance calculations to ensure compliance with the IgCC.

This proposal will simplify enforcement of this section by making the requirements consistent, both in terminology and requirements, across IgCC, ASHRAE 189.1 and CalGreen.

GG210-14

GG211-14

302.1, 505.3 (New), 505.3.1 (New)

Proposed Change as Submitted

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	Hail impact resistance roof coverings	<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

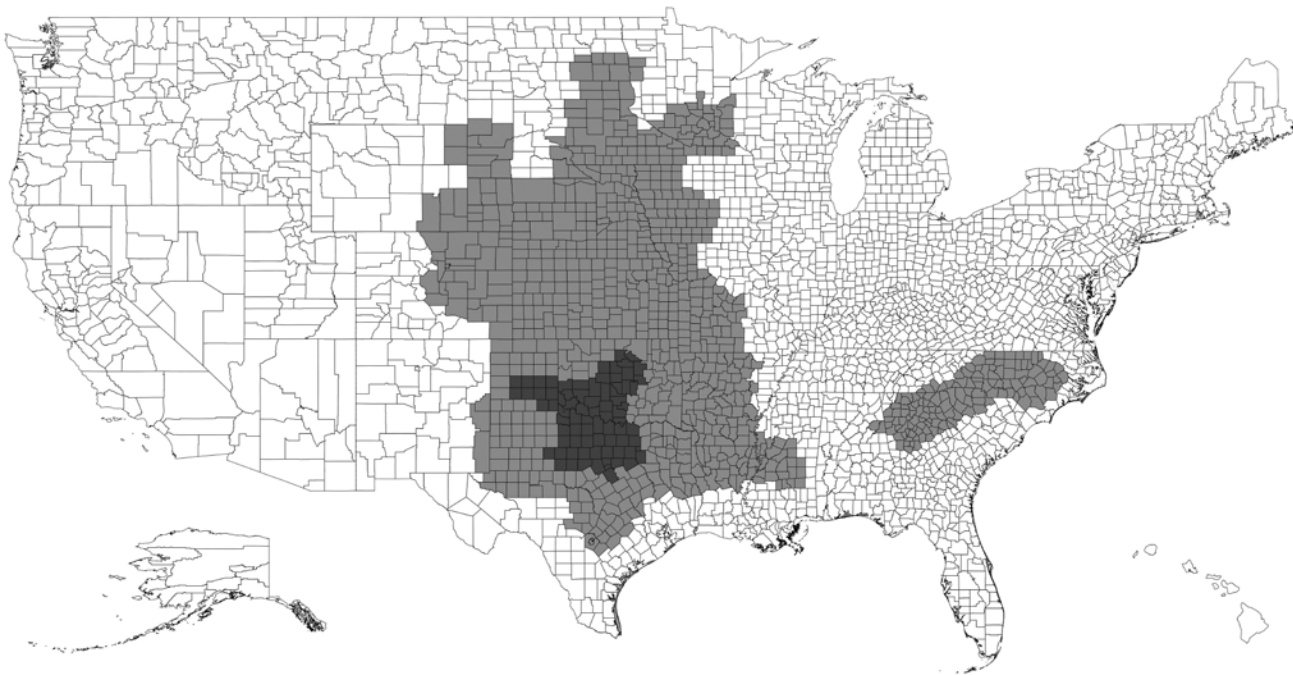


FIGURE 505.3.1
HAIL EXPOSURE MAP

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved because the proponent requested disapproval in order to come back with improved language in the public comment period.

Assembly Action:

None

Analysis: For staff analysis of the content of UL 2218-10 with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment 1:

Jonathan Roberts, representing Underwriters Laboratory requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

505.3 Roof coverings subject to hail exposure. Where indicated by Table 302.1, roof coverings on a slope greater than 2:12 used in regions where hail exposure is moderate or severe, shall be tested, listed, and labeled as determined Class 3 or Class 4, respectively, in accordance with Section 505.3.1 and Figure 505.3 UL 2218. Roof coverings on a slope of 2:12 or less, used in regions where hail exposure is moderate or severe, shall be tested, listed, and labeled as Class 3 or Class 4 respectively in accordance with test procedures adapted for slopes of 2:12 or less from UL 2218. Hail exposure regions shall be as follows:

Moderate hail exposure regions shall be where there are one or more hail days with hail diameters greater than 1.5 in (38 mm) in a 20 year period.

Severe hail exposure regions shall be where there are one or more hail days with hail diameters greater than 2.0 in (50 mm) in a 20 year period.

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.

FIGURE 505.3.1 HAIL EXPOSURE MAP

Commenter's Reason: Some concerns with our original proposal were identified at Memphis, and we therefore requested disapproval and offered to come back with a public comment that addressed all concerns. This comment accomplishes the following:

1. Clarifies that UL 2218 is only applicable to steep slope roofs, a limitation in the scope of the standard.
2. Allows the hail impact resistance criteria in UL 2218 to be used for low slope roofs. The UL 2218 testing method is appropriate to use, when adapted for low slope roofs, and several companies currently have listings for products for both steep slope and low slope applications.
3. Removes the Table 505.3.1 hail exposure region map, which is not needed, because the jurisdiction will determine if they have moderate or severe hail exposure, and if they need to require roof covering that has been evaluated for such conditions in accordance with Table 302.1.
4. Retains a description of moderate and severe hail exposures as a convenience to the user, using criteria that was developed by IBHS Research based on field data obtained from the National Climate Data Center.

Public Comment 2:

Jonathan Roberts, representing Underwriters Laboratory requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

505.3 Roof coverings subject to hail exposure. Where indicated by Table 302.1, roof coverings on a slope greater than 2:12 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 UL 2218. Hail exposure regions shall be as follows:

Moderate hail exposure regions shall be where there are one or more hail days with hail diameters greater than 1.5 in (38 mm) in a 20 year period.

Severe hail exposure regions shall be where there are one or more hail days with hail diameters greater than 2.0 in (50 mm) in a 20 year period.

505.3.1 Hail exposure regions. Hail Exposure regions in Figure 505.3.1 shall be 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.~~

FIGURE 505.3.1 HAIL EXPOSURE MAP

Commenter's Reason: Some concerns with our original proposal were identified at Memphis, and we therefore requested disapproval and offered to come back with a public comment that addressed all concerns. This comment accomplishes the following:

1. Clarifies that UL 2218 is only applicable to steep slope roofs, a limitation in the scope of the standard.
2. Removes the Figure 505.3.1 hail exposure region map, which is not needed, because the jurisdiction will determine if they have moderate or severe hail exposure, and if they need to require roof covering that has been evaluated for such conditions in accordance with Table 302.1.
3. Retains a description of moderate and severe hail exposures as a convenience to the user, using criteria that was developed by IBHS Research based on field data obtained from the National Climate Data Center.

GG211-14

GG212-14

202 (New), 505.1, 505.3 (New), 505.3.1 (New), 505.3.2 (New)

Proposed Change as Submitted

Proponent: Bill Griese, Tile Council of North America (bgriese@tileusa.com); Alison Kinn-Bennett, US Environmental Protection Agency (kinn.alison@epa.gov); Don Horn, US GSA's Office of Federal High-Performance Green Buildings (donald.horn@gsa.gov); Jessica Slomka, NSF International (jslomka@nsf.org); Jane Rohde, JSR Associates, Inc (jane@jsrassociates.net), Wes Sullens, Stopwaste.org (wsullens@stopwaste.org), Bill Freeman, Resilient Floor Covering Institute (RFCI) (williamfreeman@roadrunner.com), Jeff Carrier, Carpet & Rug Institute (jcarrier@carpet-rug.org)

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 new 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

Public Hearing Results

The following is errata that was posted to the ICC website:

Replace code change proposal with the following:

Add new definitions 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 declaration shall comply with the provisions of ISO 14025 and ISO 21930 and be externally verified.

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 wallcoverings
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 standards 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 Wallcoverings
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

(Errata already incorporated in cdpACCESS.)

Committee Action:

Approved as Submitted

Committee Reason: Multi-attribute assessment is what Europe has been doing for quite a while. No longer can there be just a claim that a product is bio-degradable or has a recycled content.

Assembly Motion:

Disapproved

Online Vote Results:

Failed - Support: 47.06% (80) Oppose: 52.94% (90)

Assembly Action:

None

Analysis: For staff analysis of the content of 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 relative to CP#28, Section 3.6, please visit:
<http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment 1:

James Hoff, Center for Environmental Innovation in Roofing, Washington, DC representing Center for Environmental Innovation in Roofing (jhoff@roofingcenter.org) requests Approve as Submitted.

Commenter's Reason: The Center for Environmental Innovation in Roofing represents the leading roofing manufacturers, roofing contractors, and professional roof consultants in North America, serving as the roofing community's primary advocate for energy efficiency and environmental responsibility. As a leading voice for matters involving roofing, energy and the environment, we would like to express our support for GG 212-14 and for the forward-looking action of the committee in approving this proposal as submitted.

Like many other building material sectors, the roofing industry is working diligently to develop environmental product declarations and multi-attribute product certifications to support the widespread implementation of GG 212-14. In fact, the roofing industry has been a leader in the development of multi-attribute certifications, as evidenced by the development of NSF-347 for the assessment and certification of sustainable single-ply roofing membranes. In addition, industry members are rapidly gearing up to publish suitable environmental product declarations, both generic and product-specific. As a result, we are confident that building designers and code officials using the 2015 edition of the International Green Construction Code will be able to find a wide variety of suitable roofing products meeting the requirements of GG 212-14.

Beyond our readiness to support this important code proposal, we wish to express our support for the committee statement that, "No longer can there be just a claim that a product is bio-degradable or has a recycled content." Such one-dimensional claims only add confusion and contradiction to the design and selection of sustainable building materials, and in many cases such claims do not accurately represent to underlying environmental impact of a particular building product.

Public Comment 2:

Jeff Inks, representing WDMA (jinks@wdma.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 declaration shall comply with the provisions of ISO 14025 and ISO 21930 and be externally verified. ~~Where a building material has a product specific, cradle to grave Type III environmental product declaration the material value shall be multiplied by two.~~

Commenter's Reason: We are supportive of giving credit to building materials for which an environmental impact assessment has been performed and for giving additional credit when it is more comprehensive. However, we believe the current proposal would more substantially meet that intent if it were to place a higher value on cradle to grave Type III EPDs, rather than give additional credit for both a minimum Type III EPD combined with a multi-attribute standard. Furthermore, the options for acquiring additional credit as proposed is limited to a small set of building materials. The modification we are proposing not only encourages a more comprehensive environmental impact assessment of building materials, the option is open to any manufacture of any type of material.

Public Comment 3:

Josh Jacobs (UL), josh.jacobs@ul.com; Alison Kinn Bennett (US EPA), (Kinn.Alison@epamail.epa.gov); Bill Freeman, Resilient Floor Covering Institute (williamfreeman@roadrunner.com); Bill Griese, Tile Council of North America (BGriese@tileusa.com); John Cross, American Institute of Steel Construction (cross@aisc.org); Wes Sullens, Stopwaste.org/Alameda County (wsullens@stopwaste.org); Jeff Carrier, Carpet & Rug Institute (jcarrier@carpet-rug.org); Jane Rohde, JSR Associates (jane@jsrassociates.net); Don Horn, US GSA (Donald.horn@gsa.gov) request Approval as Modified by this Public Comment.

Modify the proposal as follows:

505.1 Material selection and properties. Building material 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.

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, 505.2.6, or 505.2.7.~~ 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.

505.3 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.~~

505.2.63.1 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. A Type III environmental product declaration that is verified by a program operator shall be submitted for each qualifying building

material or product that complies with at least one of the preceding Sections 505.2.1 through 505.2.6. Environmental product declarations shall comply with ISO 21930 and ISO 14025, and shall include at least a cradle to gate scope covering the production stage of the life cycle for the building products. Life cycle assessment data used for environmental product declarations shall be in accordance with the principles of ISO 14040 and ISO 14044.

505.2.7.3.2 Multi-attribute material 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. Multi-attribute standard compliance methods shall be determined in accordance with an approved certification process. Materials or products that are evaluated shall comply with one of the standards or options listed below, and shall be verified for compliance by a third party, for each material or product, as applicable:

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 wallcoverings
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
10. For materials not listed in Items 1 through 9, an approved multiple-attribute standard that has defined minimum environmental performance levels that, at a minimum, focuses on the following life-cycle stages: product design, material selection, energy and water used during manufacturing, optimization of material resources, protection of air resources, performance, human health, and end of life management.

Commenter's Reason: The recommendation of the IgCC General Committee for approval of GG194 and GG212 was a step forward for the material section of the International Green Construction Code, but they included some tools and pathways for compliance in similar ways (Environmental Product Declarations) and some different things (multi-attribute standards, how to show compliance with 505.2, and the percentage required). This proposal is to help bring GG194 and GG212 in to alignment so that the pathway can be clear for manufacturers, authorities having jurisdiction, and approved agencies.

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 changes we are proposing to the previous GG212 brings in two more compliance pathways, Environmental Product Declaration and Multi-Attribute standards, which the hearing committee suggested was a good path forward for the IgCC and the membership agreed during online voting of a floor motion. This revision also allows for the possibility of other standards being developed during the time between code updates, with the addition of 505.2.7 #10. This allows the authority having jurisdiction to utilize a trusted standard developer who has developed a multi-attribute standard which meets the parameters that the other standards currently listed have met.

So these proposed additions help take a look at products 'in-total'. 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.

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.

Public Comment 4:

Josh Jacobs (UL), josh.jacobs@ul.com; Alison Kinn Bennett (US EPA), (Kinn.Alison@epamail.epa.gov); Bill Freeman, Resilient Floor Covering Institute (williamfreeman@roadrunner.com); Bill Griese, Tile Council of North America (BGriese@tileusa.com); John Cross, American Institute of Steel Construction (cross@aisc.org); Wes Sullens, Stopwaste.org/Alameda County (wsullens@stopwaste.org); Jeff Carrier, Carpet & Rug Institute (jcarrier@carpet-rug.org); Jane Rohde, JSR Associates (jane@jsrassociates.net); Don Horn, US GSA (Donald.horn@gsa.gov) request Approval as Modified by this Public Comment.

Modify the proposal 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, multi-attribute standards, and environmental product declarations that comply with Sections ~~505.4~~ 505.2.1 through ~~505.2.5~~ 505.2.7 such that the aggregate total materials compliant with those sections constitute at least ~~70~~ 80 percent of the total building products and materials used, based on mass, or cost, used singularly or in combination.
2. Compliance with Item 1 except that such materials shall be used for at least ~~85~~ 90 percent of the total mass, or cost of materials in the project.

Commenter's Reason: The IgCC General Committee's recommendation for approval of GG194 made these project electives essentially a step backward. This is to update the material selection project elective so as to bring it in line with the recommendations for approval of GG194 and GG212.

Public Comment 5:

Craig Conner, representing self (craig.conner@mac.com) requests Disapprove.

Commenter's Reason: GG212 makes the existing Section 505 more complicated by adding ten more standards. The existing section is hard fail. Buildings will pass without even using these new standards. Wood will be "bio-based" (Section 505.2.4 #1). Steel will be recycled (Section 505.2.2). Concrete will be indigenous (local). Wood, steel and concrete are good materials, but why do we need a calculation to show that wood, steel and concrete will make up most of a conventional building? Why make the section more complicated? GG192 is preferable.

Public Comment 6:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Disapprove.

Commenter's Reason: We recommend that this proposal be disapproved for the following reasons:

Point #1 – The proponent's suggestion that EDP's and Multi-attribute methodologies are equivalent trade-offs to the current 505.2 subjects has not been substantiated as an equivalent modification. The EPD and Multi-attribute provisions represent a process for articulating transparency of materials or products only, whereas the other provisions represent a more robust sustainability requirement (e.g. Recycling, recyclability, bio-based, indigenous, etc.). Based on the above, we disagree that the current Section 505.2 provisions be considered equivalent as shown in this proposal.

Point #2 – The proposal has faults, for example Section 505.3.1 only discusses the use of a "program operator," whereas the ISO standards require both an operator and independent verification to take place to demonstrate compliance. Further, there is no discussion if the focus is a "cradle-to-cradle" or "cradle-to-gate" minimum requirement. In addition, this section uses the term "externally" following the reference to the standards, but applying this term at this location is of no value in this context.

Point #3 – The committee reason statement illustrates short sightedness. By not assessing how other foreign countries adopted the use of EPD's and Multi-attribute methodologies represents the more critical question. In the case of this proposal that question has not been successfully answered.

In view of the above we recommend disapproval.

Public Comment 7:

Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net) requests Disapprove.

Commenter's Reason: This code change is unwieldy and will not be usable by code officials. Additionally, the complexity of the proposed code allows for a wide range of loopholes for manufacturers to achieve compliance without actually promoting green construction.

GG212-14

GG214-14

506.2, 506.3, 506.1, 506.1.1 (New), 506.1.2 (New), 506.1.3 (New)

Proposed Change as Submitted

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 (New) 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 (New) 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 (New) 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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The Committee agreed with the proponent’s published reason statement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Jack Bailey, One Lux Studio, representing International Association of Lighting Designers (jbailey@oneluxstudio.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

506.1 Low mercury lamps. The Mercury content in lamps shall comply with Sections 506.1.1, ~~506.1.2 and 506.1.3~~ and 506.1.2 as applicable.

Exception: Mercury content is not limited for lighting integral to equipment or instrumentation and installed by the manufacturer.

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.

506.1.3 Circular fluorescent lamps. ~~Circular fluorescent lamps shall contain not more than 5 milligrams of Mercury per lamp.~~

Commenter’s Reason: Two changes are proposed:

The first change adds the reference to UL 1993 for compact fluorescent lamps back into the code. This reference is included in the 2012 IGCC and is an important safety provision which should be retained.

The second change eliminates the mercury restriction for circular fluorescent lamps. This provision was added at the recommendation of one lamp manufacturer but does not actually represent a consensus standard within the lighting industry, and as such is not appropriate for inclusion in the code.

Public Comment 2:

Marilyn Williams, NEMA, representing National Electrical Manufacturers Association (mar_williams@nema.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

506.1 Low mercury lamps. The Mercury content in lamps shall comply with Section 506.1.1 and 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, or for lamps with a high color rendering index that is greater than or equal to 87.

506.1.1 Straight fluorescent lamps. Non-Preheat straight, double-ended fluorescent lamps less than ~~6 feet-70 inches~~ (1800 mm) and greater than 21 inches (550 mm) in length, and containing a medium bi-pin base or miniature bi-pin base, 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 an average of 3 milligrams of Mercury per lamp.
2. T-8 lamps with a rated lifetime less than 25,000 hours at 3 hours per start on an instant start ballast shall contain not more than an average of 4 milligrams of Mercury per lamp.
3. All ~~others other~~ T5 or T8 lamps 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 an average of 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. Circular fluorescent lamps shall contain not more than 5 milligrams of Mercury per lamp.~~

Commenter's Reason: Reason: The previous language changes removed all specialty lamp exception definitions originally contained within this section. Clarifying language is now needed to more carefully define and target the lamps used in green buildings while avoiding unintentionally covering specialty lamp types. Uses averages to address small manufacturing tolerances during lamp production. Proposal does not change approved mercury levels for linear fluorescent and CFL lamps simply provides clarifying language. Proposal removes 506.1.3 for circular lamps which have little use in green buildings. (506.1.3 also proposed a technically inaccurate mercury limit for these lamp types.)

GG214-14

GG217-14
507.1, 507, 903.1

Proposed Change as Submitted

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	X	None	Field	Periodic	None	507.1 and

Chapter 5: Material Resource Conservation and Efficiency						
dampproofing			inspection and verification	inspection for the entire foundation		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

(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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee approved this proposal based on the proponent's reason statement and because all building should have moisture preventative measures, not just green buildings.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Jay Crandell, Applied Building Technology Group LLC, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz) requests Approve as Modified by this Public Comment.

Replace the proposal 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	50 %		
		65%	75%	
<u>507.1</u>	<u>Building envelope moisture control</u>	Yes		No

(Portions of table not shown remain unchanged)

507.1 Building envelope moisture control preventative measures. Where indicated by the jurisdiction in Table 302.1, building envelope 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.

Commenter's Reason: Rather than completely delete the enhanced moisture control provisions from the IgCC, this public comment gives the local jurisdiction the ability to "opt out" of these requirements. Clearly, the severity of moisture control and related durability concerns vary by regional and local climatic conditions. Thus, it is appropriate to consider them a jurisdictional option as proposed in this public comment.

The GG217 proposal reason statement indicates that all the required moisture control actions are in the building code and that durability is not a concern with the IgCC green code. This reason statement -- the basis upon which the proposal was approved -- is not correct. These requirements are not the same as in the building code and durability is extremely important to green codes, such as the IgCC. Without durability, sustainability is meaningless. As with many other aspects of the IgCC, there is plenty of room (and need) for improvement over the minimum base code requirements.

The moisture control provisions in IgCC Table 903.1 require periodic inspection which is necessary when critical moisture control elements are concealed in real time as part of construction process sequencing. There is no "stopping point" whereby a complete system is finished, then inspected, then concealed by the next activity. Instead, many moisture control activities are integrated activities that become concealed as construction progresses in real time. Thus, periodic inspection is very important for items such as the water-resistive barrier and flashing. Furthermore, the building code does not even require a single "point in time" inspection of these elements and in many cases they are not included in local building department inspection protocols. It is, however, understandable due to the demands upon building officials. But, in the IgCC (and also in Chapter 17 of the IBC), these important periodic inspections can be completed by third parties, such as approved agencies or inspection agencies. Such resources are available to help ensure that buildings that are intended to be "green" are also durably and consistently green by way of periodic inspection of elements that are concealed, yet critical to the life-expectancy and performance of the building. A separate public comment on this proposal (by this PC proponent) also provides and additional means to achieve "built-in" quality control of critical moisture control components.

The intent of this public comment is to ensure that quality is "built-in" to the construction while it is being built and while the elements critical to building durability and sustainability are being placed and concealed. For moisture control, quality cannot be effectively "inspected in" after concealment or be easily remedied after the fact. With this improved and flexible approach to moisture control commissioning for durable and sustainably constructed buildings, the ICC membership is encouraged to disapprove the original GG217 proposal and approve this public comment.

Public Comment 2:

Jay Crandell, Applied Building Technology Group LLC, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz) requests Approve as Modified by this Public Comment.

Replace the proposal 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

(No changes to table)

For SI: 1 square foot = 0.0929 m².

- a. Where approved by the code official, the indicated moisture control commissioning requirements shall be deemed satisfied by a contractor quality control program. Such program shall be independently audited by an approved agency and include periodic inspection by qualified quality control personnel of the contractor with procedures to document and resolve identified corrective actions.

Commenter's Reason: To provide additional flexibility in meeting the intent of periodic inspections (and to reduce demands on code officials or third-party inspection services), an optional means of compliance is provided as a footnote to Table 903.1. This approach is offered in coordination with a separate public comment to make the moisture control periodic inspections a jurisdictional requirement that can be "opted-in" or "opted-out" based on local need and climatic conditions. Both public comments offer unique and complimentary alternatives to deleting enhanced moisture control provisions from the IgCC as originally proposed in GG217. Enhanced moisture control is important to durability and durability is important to green or sustainable construction.

This public comment permits the use of a certified and audited quality control program administered by the contractor or installation trade involved in the work requiring periodic inspection. A similar procedure is commonly used in the quality control of building material production and, therefore, has merits in the construction of buildings (which is also a production process). Such programs also existing currently in the construction market.

Whether by periodic inspection or a legitimate contractor quality control program, the intent of this public comment is to ensure that quality is "built-in" to the construction while it is being built and while the elements critical to building durability and sustainability are being placed and concealed. For moisture control, quality cannot be effectively "inspected in" after concealment or easily corrected after the fact. With this improved and flexible approach to moisture control commissioning for durable and sustainably constructed buildings, the ICC membership is encouraged to disapprove the original GG217 proposal and approve this public comment.

Public Comment 3:

Theresa Weston, DuPont, representing DuPont (theresa.a.weston@usa.dupont.com) requests Disapprove.

Commenter's Reason: This section should not be deleted. Building envelope moisture control is critical to the durability of buildings. If a building suffers from moisture damage it may require additional resources and energy for remediation. Therefore, moisture durability is a key attribute of green building. While the requirements in this section mirror the IBC requirements, this section requires additional verification / inspections over that of the IBC, and is therefore suitable as an overlay.

GG217-14

GG218-14

507

Proposed Change as Submitted

Proponent: David Collins, The Preview Group, representing The American Institute of Architects (dcollins@preview-group.com)

Delete without substitution:

~~SECTION 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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee approved this proposal based on the proponent's published reason statement and the committee's prior action on GG217-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Jay Crandell, Applied Building Technology Group LLC, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz) requests Disapprove.

Commenter's Reason: This PC is submitted in coordination with separate PCs on GG217 by this PC proponent. Refer to the reason statement for the PCs on GG217.

Public Comment 2:

Theresa Weston, representing DuPont (theresa.a.weston@usa.dupont.com) requests Disapprove.

Commenter's Reason: This section should not be deleted. Building envelope moisture control is critical to the durability of buildings. If a building suffers from moisture damage it may require additional resources and energy for remediation. Therefore, moisture durability is a key attribute of green building. While the requirements in this section mirror the IBC requirements, this section requires additional verification / inspections over that of the IBC, and is therefore suitable as an overlay.

GG218-14

GG219-14

507.1, 903.1

Proposed Change as Submitted

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 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
8. <u>Lightweight structural concrete roof deck</u>	<u>X</u>	<u>None</u>	<u>Field inspection and verification</u>	<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>	<u>None</u>	<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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal addresses an important omission in the code's moisture control preventative measures. The option of a vapor retarder will assist. One of the questions was whether this will impede the efficiency of scheduling in the application of any of roofing materials. That may be true, and this list may be better placed in the International Building Code (IBC). The proponent should propose a similar change to the IBC as well. It is important that concrete be properly cured.

Assembly Action:

None

Analysis: For staff analysis of the content ASTM F2170-11 with regard to the ICC criteria for referenced standards (Section 3.6 of CP #28), please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net) requests Disapprove.

Commenter's Reason: This proposal does have some validity to a moisture control issue that has presented itself in a real world application, but the IgCC is not the correct venue for its placement. It is better suited to be placed within the IBC, and although the committee approved this change they commented to that effect. The committee's reason statement states that "this would be better suited in the IBC", and asks the proponent to submit a similar change for the IBC. This is an issue that should be addressed across the board with all projects, not just the projects in a jurisdiction that has adopted the IgCC. The IgCC is an overlay code, and should not be used as a placeholder for concepts that belong in other I-codes. If the best placement for a change is within another I-code then that is where it should be proposed. With that being said we agree that there is a concern over properly cured concrete roof decking, and the moisture control issues arising are not just flashing problems.

GG219-14

GG226-14

802.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee recommended this proposal for approval as submitted because it clarifies and updates the code and improves the performance of air handling and HVAC air filters.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

802.3 Air-handling filtration and bypass pathways. Air handling equipment and HVAC equipment shall be designed and installed to limit the amount of airflow that bypasses the air filters and shall comply with the following:

1. Channels, racks and other filter holding retaining constructions that do not seal tightly to the filter frame by means of a friction fit shall provide be provided with a means to seal the filter frame to the filter holding construction.
2. Where standard size filters are installed in banks of multiple filters, gaskets shall seal the gap between the frames of adjacent filters.
3. 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 retaining construction.
4. Channels, racks and other filter holding retaining constructions shall be sealed to the duct or housing of the HVAC equipment served by the filters.
5. Filter access doors in ducts and HVAC equipment shall be designed to limit the amount of airflow that bypasses the filters.
6. Field or shop fabricated spacers shall not be installed for the purpose of replacing the intended size filter with a smaller size filter.
7. Gaskets and seals shall be accessible for repair, maintenance and replacement.

Commenter's Reason: The content of the original code submittal, approved as submitted by the committee, was well thought out; however the language and format are confusing for the users. The revised code language was put into a format that is readable and useable to contractors and code officials alike. This change to the formatting is more in line with typical code language that is found throughout the International body of codes. A series of bullet points makes it easier to check for compliance without missing anything. No change has been made to the content of the proposal which was approved as submitted.

Public Comment 2:

Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net) requests Disapprove.

Commenter's Reason: The content of the original code submittal may have been well thought out in its concept. The language and formatting as it stands is confusing and unreadable for the users, and is not in typical code language found throughout the I-codes. We would prefer to keep the existing language in the IgCC instead of this code change.

GG226-14

GG228-14

803.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee approved this proposal based on the proponent's published reason statement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Emily Lorenz, representing self (emilyblorenz@gmail.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

803.3 Environmental tobacco smoke control. Smoking shall not be allowed inside of buildings, except in areas with Group R occupancies. 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.

Commenter's Reason: Most of the controversy with this section revolves around homeowners' rights to smoke in their own homes. This new language adds "except in areas with Group R occupancies" to the original language. This allows change smoking in Group R occupancies. It doesn't make sense to have a green standard that takes numerous steps to reduce contaminants indoors and then allows smoking indoors. Retaining this section as modified is consistent with the goals of Chapter 8 and the IgCC. The scope of Chapter 8 is to ensure that the building's interior environment is conducive to the health of building occupants. A code that allows smoking is not conducive to the health of the building occupants.

Public Comment 2:

Martha VanGeem, representing self, requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

803.3 Environmental tobacco smoke control. Where smoking is prohibited inside a building, 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.

Commenter's Reason: This modification retains the sentence from the 2012 IgCC that prohibits designated smoking areas near building entrances, outdoor air intakes, and operable windows. This section as modified is consistent with the goals of Chapter 8 and the IgCC. The scope of Chapter 8 is to ensure that the building's interior environment is conducive to the health of building occupants.

GG228-14

GG 234-14

804.2

Proposed Change as Submitted

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

MAXIMUM CONCENTRATION OF AIR POLLUTANTS RELEVANT TO IAQ	MAXIMUM CONCENTRATION, ug/m ³ . (unless otherwise noted)
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/m^3 = 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/m^3 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/m^3 were removed because the 500 ug/m^3 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/m^3 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>.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal removes control of some pollutants from the code that need to be controlled.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Brenda Thompson, representing Chair, Sustainability, Energy & High Performance Building Code Action Committee (SEHPCAC) and David Collins, representing The American Institute of Architects (dcollins@preview-group.com) request Approve as Modified by this Public Comment.

Replace the proposal 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 ~~comply with the levels of VOCs meet the levels detailed concentration limits 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 Section 804.2.1.~~ 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 Section 804.2.1 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 AIR POLLUTANTS**

804.2.1 Maximum levels of indoor air contaminants. Levels of indoor air contaminants by testing of indoor air shall not exceed the following:

1. Carbon monoxide (CO): 9 parts per million and not to exceed outdoor levels by 2 parts per million as tested in accordance with accepted industry practice;
2. Formaldehyde: 27 parts per billion as tested in accordance with ASTM D 5197;
3. Particulates (PM10): 150 micrograms per cubic meter as tested in accordance with ISO 7708;
4. 4-Phenylcyclohexene (4-PCH), where fabrics and carpets with styrene butadiene rubber (SBR) latex backing, are installed: 2.5 micrograms per cubic meter as tested in accordance with ASTM D 6196, ASTM D 5466, or ASTM D 6345;
5. Total Volatile Organic Compounds (TVOC): 500 micrograms per cubic meter as tested in accordance with ASTM D 6196, ASTM D 5466 or ASTM D 6345.

Commenter's Reason: Many who have been responsible for verifying compliance with Table 804.2 and similar provisions of other green and sustainable standards and rating systems have been frustrated because many aspects of the table are inconsistent or ineffective. For example, Carbon Monoxide and Particulates are Nonvolatile Organic Compounds, yet are included in Table 804.2. This public comment replaces the original proposal with revisions based on the 2013 edition of Cal Green, which focuses on priority contaminants.

Furthermore, emissions of VOCs and formaldehyde from products and materials are already limited in Section 806: for Composite wood products (806.1), Adhesives and Sealants (806.2), Architectural paints and coatings (806.3), Flooring (806.4), Acoustical Ceiling tiles and wall systems (806.5), Insulation (806.6). Indoor Air Quality testing as regulated by Section 804.2 should focus on potential contaminants that may arise from the completed building and the HVAC system in operation.

Carbon monoxide should be tested in accordance with ASTM D 3162. However, new standards cannot be introduced in the public comment period. As such the SEHPCAC used the phrase "in accordance with accepted industry practice" and directs

staff by this reason to include a reference to ASTM D 3162 in the commentary to the 2015 IgCC so that code officials have guidance in their approval of what constitutes "accepted industry practice."

This comment was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC) and the American Institute of Architects. 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>.

GG234-14

GG235-14

202 (New), 804.3 (New), Table 804.3 (New)

Proposed Change as Submitted

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</u>	<u>Calaveras</u>	<u>Jackson</u>	<u>Litchfield</u>
<u>Colbert</u>	<u>Borough</u>	<u>Contra Costa</u>	<u>Jefferson</u>	<u>Tolland</u>
<u>Coosa</u>	<u>Kenai Peninsula</u>	<u>El Dorado</u>	<u>Kiowa</u>	<u>Windham</u>
<u>Franklin</u>	<u>Borough</u>	<u>Fresno</u>	<u>Kit Carson</u>	
<u>Jackson</u>	<u>Matanuska-Susitna</u>	<u>Inyo</u>	<u>La Plata</u>	<u>DELAWARE</u>
<u>Lauderdale</u>	<u>Borough</u>	<u>Kern</u>	<u>Larimer</u>	<u>Zone 2</u>
<u>Lawrence</u>	<u>Southeast Fairbanks</u>	<u>Los Angeles</u>	<u>Las Animas</u>	<u>New Castle</u>
<u>Limestone</u>	<u>Census Area</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>	<u>Zone 1</u>	<u>Vermilion</u>	<u>Zone 1</u>	<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>	<u>Zone 2</u>	<u>Boone</u>	
<u>Zone 1</u>	<u>Cass</u>	<u>Bond</u>	<u>Carroll</u>	<u>Zone 2</u>
<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>Allegany</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>Daviess</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>Watsonwan</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>Daviess</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>	<u>MONTANA</u>	<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>	<u>NEW HAMPSHIRE</u>	<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>	<u>NEW JERSEY</u>	<u>San Juan</u>	<u>Oneida</u>	<u>NORTH DAKOTA</u>
<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>	<u>NEW YORK</u>	<u>NORTH CAROLINA</u>	<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>Allegany</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>
<u>NEVADA</u>	<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>Trail</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	Zone 2	<u>Clarke</u>
<u>Stanley</u>	<u>Marshall</u>	Zone 2	<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>
Zone 2	<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>	Zone 2	<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>	Zone 2	<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>
Zone 2	<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>	Zone 2	
<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>	Zone 1
<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>	Zone 1	<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>	

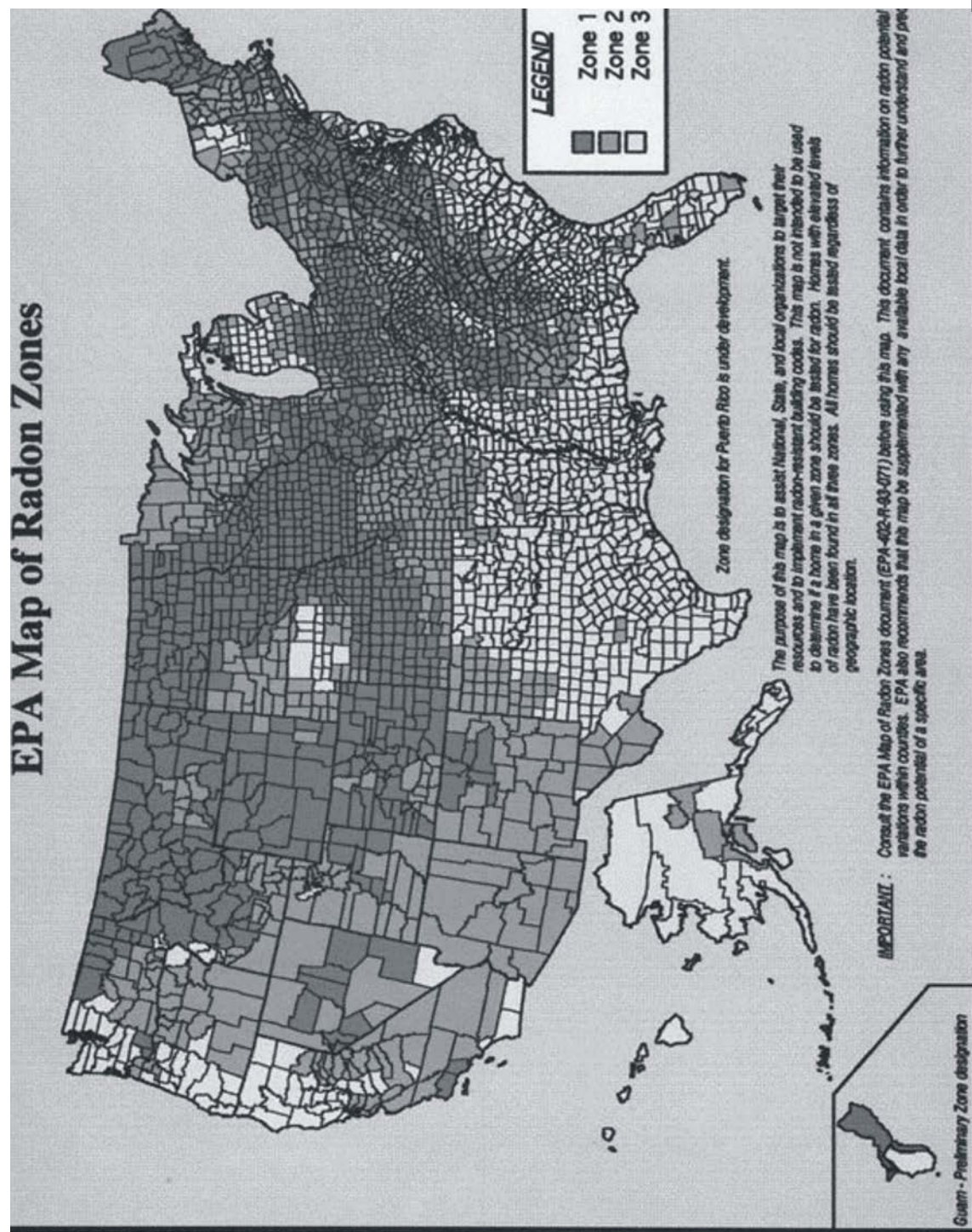


FIGURE 804.3

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)-KAPTUROWSKI758

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Requiring pre-occupancy testing will create problems if it is found that something needs to be done after construction. It is unclear as to what needs to happen if high levels are found. The term qualified is a problem as it is unclear as to how to determine who is qualified.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

David Kapturowski, Spruce Environmental Technologies, Inc., representing American Association of Radon Scientists and Technologists requests Approve as Modified by this Public Comment.

Modify the proposal 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 this section is indicated to be applicable in Table 804.3, radon testing 302.1, the building shall be performed prior to occupancy of the building. Such testing shall be performed tested for radon by a qualified an approved 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.

Commenter's Reason: 21,000 people die each year from radon-induced lung cancer. This proposal has been modified to allow local jurisdictions to consider testing for the presence of this class A carcinogen.

GG235-14

GG236-14

804.3 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved because, although carbon monoxide detectors save lives, this information does not belong in the IgCC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

804.3 Carbon monoxide detectors alarms and detection. Buildings that contain one or more gas, liquid or solid fuel-fired appliances shall be provided with one or more meet the provisions for carbon monoxide detectors located in each occupied story. Carbon monoxide detectors shall be installed in accordance with alarms and detection as required by the requirements of NFPA 720 International Building Code.

Commenter's Reason: Carbon monoxide has a highly negative effect on indoor environmental quality, and a green building should meet the requirements for alarms and detection.

GG236-14

GG249-14

807.3.2

Proposed Change as Submitted

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	35
	Educational occupancies above 12th grade	(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	45
	Conference rooms	45
Educational E	Educational occupancies above 12th grade	35
	Core learning lecture and classrooms that are less than or equal to 20,000 cubic feet in volume	(See Educational)
	Core learning lecture and classrooms that are greater than 20,000 cubic feet in volume	(See Educational)
	Open plan classrooms Administrative offices and rooms Music teaching studios Music practice rooms	(See Educational)
Institutional I-2	All areas	ANSI/ASA S12.60-2010/Part 1 or ANSI/ASA S12.60-2009/Part 2
	Wards Private and semi-private patient rooms	2010 FGI-ASHE Guidelines for Design and Construction of Healthcare Facilities
	Operating rooms Corridors and public areas	
	Rooms or suites	
Residential R-1 and R-2	Bathroom, kitchen, utility room	25 to 35
	Meeting rooms Corridors and lobbies Service areas	40
Residential R-1 and R-2	Meeting rooms	35
	Corridors and lobbies	45
	Service areas	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 : TABLE 807.3.2-PAARLBERG661

Public Hearing Results

The following is errata that was posted to the ICC website:

**TABLE 807.3.2
MAXIMUM PERMISSIBLE INDOOR BACKGROUND SOUND IN ROOMS**

OCCUPANCY TYPE	ROOM	NOISE CRITERIA (NC) LIMITS
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
	Rooms or suites	25 to 35
	Bathroom, kitchen, utility room	40

(Portions of table and proposal not shown do not have errata.)

(Errata already incorporated in cdpACCESS.)

Committee Action:

Approved as Modified

Modify the proposal as follows:

**TABLE 807.3.2
MAXIMUM PERMISSIBLE INDOOR BACKGROUND SOUND IN ROOMS**

OCCUPANCY TYPE	ROOM	NOISE CRITERIA (NC) LIMITS
Institutional I-2	All areas	2010 FGI-ASHE Guidelines for Design and Construction of Healthcare Facilities

(Portions of table not shown are not modified.)

Committee Reason: The Committee modified the proposal because the modification coordinates with the Committee's action on GG245-14. The Committee approved the proposal as modified to coordinate with the Committee's action on GG245-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Noral Stewart, Stewart Acoustical Consultants, representing Acoustical Society of America, Institute of Noise Control Engineering, ASTM International Committee E33 task group on building codes, Facilities Guideline Institute Acoustics Working Group, The American Society of Heating, Refrigeration, and Air Condition (noral@sacnc.com) requests Approve as Submitted.

Commenter's Reason: The committee in modifying the original proposal to delete reference to sound level requirements for I-2 facilities failed to recognize that not all I-2 facilities are required to meet the FGI-ASHE requirements. Not all jurisdictions enforce

that document. Thus, either the language in the current code or that proposed in the proposal would be required to have any requirements for sound levels in facilities not covered by the FGI-ASHE requirements. It is understood that the reference to the year 2010 will be removed editorially.

This comment submitted on behalf of the Acoustical Society of America (ASA), the Institute of Noise Control Engineering of the USA (INCE), ASTM International Committee E33 task group on building codes, TC 2.6 of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), the Facilities Guideline Institute (FGI) Working Group on Acoustics, and the National Council of Acoustical Consultants (NCAC).

GG249-14

GG251-14

807.5

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The Committee agreed with the proponent's published reason statement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Noral Stewart, representing National Council of Acoustical Consultants, American Society of Heating, Refrigeration & Air Conditioning Engineers TC 2.6, Facilities Guideline Institute Acoustics Working Group, Acoustics Working Group, Acoustical Society of America, Institute on Noise Control Engineering (noral@sacnc.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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. New laboratory tests for STC of an assembly are not required where the STC has been established by prior tests.

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.

807.5 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.

Commenter's Reason: The original proposal was to add an exception to the end of Section 805 saying "Special Inspections and reports are not required for approved assemblies with an established Sound Transmission Class (STC) rating. Section 805 is actually about the measurement of sound levels from HVAC systems or other sources. It has nothing to do with the STC of partitions. The appropriate place to add such a concern is in Section 807.2.1 with a statement similar to what was inserted in Section 804 regarding IIC ratings. The change as proposed here would cover the concerns expressed in the original proposal in the appropriate place consistent with the way the issue was addressed for IIC and with consistent similar language.

This comment submitted on behalf of the Acoustical Society of America (ASA), the National Council of Acoustical Consultants (NCAC), the Institute of Noise Control Engineering of the USA (INCE), ASTM International Committee E33 task group on building codes, Technical Committee 2.6 of the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE), and the Facilities Guideline Institute Acoustics Working Group.

GG251-14

GG254-14

807.5, 807.6

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee recommended the proposed language for approval because it strengthens the code section and is consistent with the International Building Code and the commissioning chapter of the IgCC. Deficiencies should be brought to the attention of the design professional and the owner and corrections should be made.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Noral Stewart, representing Acoustical Soc. of America, Nat. Council of Acoustical Consultants, Inst. of Noise Control Eng., Facilities Guideline Inst. Acoustics Working Group, ASTM International Comm. E33 task group on building codes, TC 2.6 of the Am. Soc. of Heating Refrigeration (noral@sacnc.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

807.5 Special inspections for sound levels. An approved agency, employed 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 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.

Commenter's Reason: This proposal as originally submitted changed the word "funded" to "employed", deleted the words "applicable laws and ordinances," and added the other words "of the contractor for correction. If they are not corrected the discrepancies shall be brought to the attention". This did not all show up properly in the proposal as retrieved for this comment. This comment only addresses and proposes to retain the words "applicable laws and ordinances." The original proponents of the IgCC wanted to include limits on sound levels at boundaries. However, this creates problems since many local governments and some states already have laws and ordinances governing such. Historically, this has been covered by state and local laws and regulations and not in building codes. Section 807.3.1 recognizes this, as it must to avoid conflicts (such as discussed in GG 245-14 with regard to the FGI-ASHE requirements), imposes such other limits where they exist, and then imposes the limits in this code only when such other limits do not exist and when there is no state law forbidding the limits in this code. Some people have noted that these local and state regulations are inadequate in some cases where they exist and believe the code should be more stringent. However, some states have taken control in state law and forbid local governments or state agencies from attempting to implement or enforce limits lower than specified in state law. Thus, in those states the code must defer to state law and even the attempt to adopt something different is illegal. If this code is going to have limits on sound at boundaries and require enforcement of such, then anyone involved in such enforcement, just like the engineers and acoustical consultants who must do the design to meet them, must research and educate themselves on all the applicable regulations.

This comment provided on behalf of the National Council of Acoustical Consultants, ASTM International Committee E33 task group on building codes, Acoustical Society of America, Institute of Noise Control Engineering, Technical Committee 2.6 of the American Society of Heating Refrigeration and Airconditioning Engineers, and the Facility Guideline Institute Acoustics Working Group.

GG254-14

GG256-14

807.6

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee recommended this proposal for approval to be consistent with prior committee action on GG251-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Maureen Traxler, representing Seattle Dept of Planning & Development (maureen.traxler@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

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: Special Inspections Commissioning and reports are not required for *approved* assemblies with an established sound transmission class (STC) rating.

Commenter's Reason: GG253, which was approved as submitted by the Code Development Committee, changed "special inspections" to "commissioning" in this section and in several other sections related to sound. This comment makes the exception consistent with GG253. Section 807.6 requires testing of the installed assemblies, which is commissioning. Special inspection usually takes place during construction rather after.

GG256-14

GG258-14

302.1, 807, 903.1, Appendix E (New)

Proposed Change as Submitted

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:

~~807.5.1~~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
807.1	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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Moving the IgCC acoustics provisions to an appendix accomplishes nothing because they are already a jurisdictional choice in Table 302.1. In both cases, the jurisdiction must make a specific choice to enforce the provisions before they become mandatory.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mark Nowak, representing Steel Framing Alliance requests Approve as Submitted.

Commenter's Reason: The base IRC and IBC codes already address acoustics issues from a basic health and safety perspective. No evidence was provided in past revisions to support that the existing IgCC requirements will lead to specific benefits compared to the base codes. The requirements simply evolved from an argument that more is better.

The existing language also 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. This is best regulated in zoning and planning ordinances.

Last, 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. Under this scenario, a local ordinance could be wholly inadequate yet still be used to comply with the IgCC. This sets up the possibility of vastly different requirements even in adjacent jurisdictions, or within the same jurisdiction.

These points demonstrate that acoustic requirements beyond those in the IBC are primarily a local decision. Moving the acoustics section to an appendix will retain decision-making on acoustics at the local level where specific ordinances can be examined for potential conflicts and acceptable minimum protection adopted in consideration of local conditions and concerns.

GG258-14

GG263-14

202 (New), 202, 808.3.1, 808.3.1.2, 808.3, 808.3.1.1, 808.3.2

Proposed Change as Submitted

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.~~

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.

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 daylight area, any overlapping daylight 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 daylight 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 daylight 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 daylight 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 daylight 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~~ 808.3.1.4
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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The Committee approved the proposal for consistency with what will be in the 2015 IECC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Marilyn Williams, representing National Electrical Manufacturers Association (mar_williams@nema.org) requests Disapprove.

Commenter's Reason: Rationale:

1. The proposal includes a new definition of "DAYLIGHT ZONE" which is very different from "DAYLIGHT ZONE" as defined in IECC 2012 or IECC 2015. IgCC is an overlay code to IECC and it cannot contradict IECC, only add to it. If the proposed definition is not deleted, the resulting requirements are totally subjective and unenforceable. The current language is preferable.
2. Daylit area is not a defined term, but is used in the code language as if it is a defined term. This is very confusing. In some sense, the definition of daylit area is given in the first requirement in proposed section 808.3.1, where it becomes essentially the same as DAYLIGHT ZONE as defined in IECC. Having said that, the language here is overly complicated ("daylit area shall be located within a ... daylight zone" – emphasis added), and even if we fix this it is not clear why we need two terms that refer to the same thing. The current language is preferable, even if not ideal.
3. Even if the proposed definition of "DAYLIGHT ZONE" is deleted, there is a problem. In Section 808.3 (existing language) the total daylit area in a building space (now equivalent to DAYLIGHT ZONE per IECC definition) has to be either 50% or 25% of the total floor area, depending on the number of stories above grade. In proposed Section 808.3.1, the effective aperture of the fenestration is required to be greater than a minimum defined in Table 808.3.1. The issue is that (1) the definition of effective aperture includes daylit area in the denominator, and the area of fenestration in the numerator, and (2) the definition of the DAYLIGHT ZONE in IECC 2015 depends on the height (and thus the area) of the fenestration. These circular definitions and conditions are potentially problematic and may lead to requirements that cannot be physically met given the 30% maximum window to wall ratio in IECC[1]. The current language is more preferable, even if not ideal.

In addition, the exception to Section 808.3 – both existing and proposed language – has a potentially fatal problem. Our understanding is that this problem cannot be addressed in the current process because there is no proposal that suggested modification to this section. However, without fixing it the exception section may be entirely unusable. The issue is that Equation 8-1 requires the daylit area to be greater than or equal to 25% of the total daylight potential. The daylit area has dimensions of square feet (or m²), but the total daylight potential, as defined, is a dimensionless number ≤ 1 . As written, it is impossible to use equation 8-1, and therefore the entire section 808.3 is unusable for buildings that have obstructed exterior walls or shaded roofs.

[1] For example, for skytype C Table 808.3.1 requires a minimum EA of 0.2, or $E_{Amin} = 0.2$. This means $AF * VT / DA > E_{Amin}$, or $AF / DA > E_{Amin} / VT$. For relatively clear class, $VT = 0.6$, say, so the requirement is equivalent to $AF / DA > 0.33$. But DA can be approximately equal to the wall area, so this requirement may contradict the maximum window to wall ratio requirement in IECC. Furthermore, this problem gets exasperated as VT is reduced, meaning that IgCC would not allow low VT glass in any application in areas with skytype C.

GG263-14

GG267-14

202, 809 (New), Appendix B

Proposed Change as Submitted

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.)

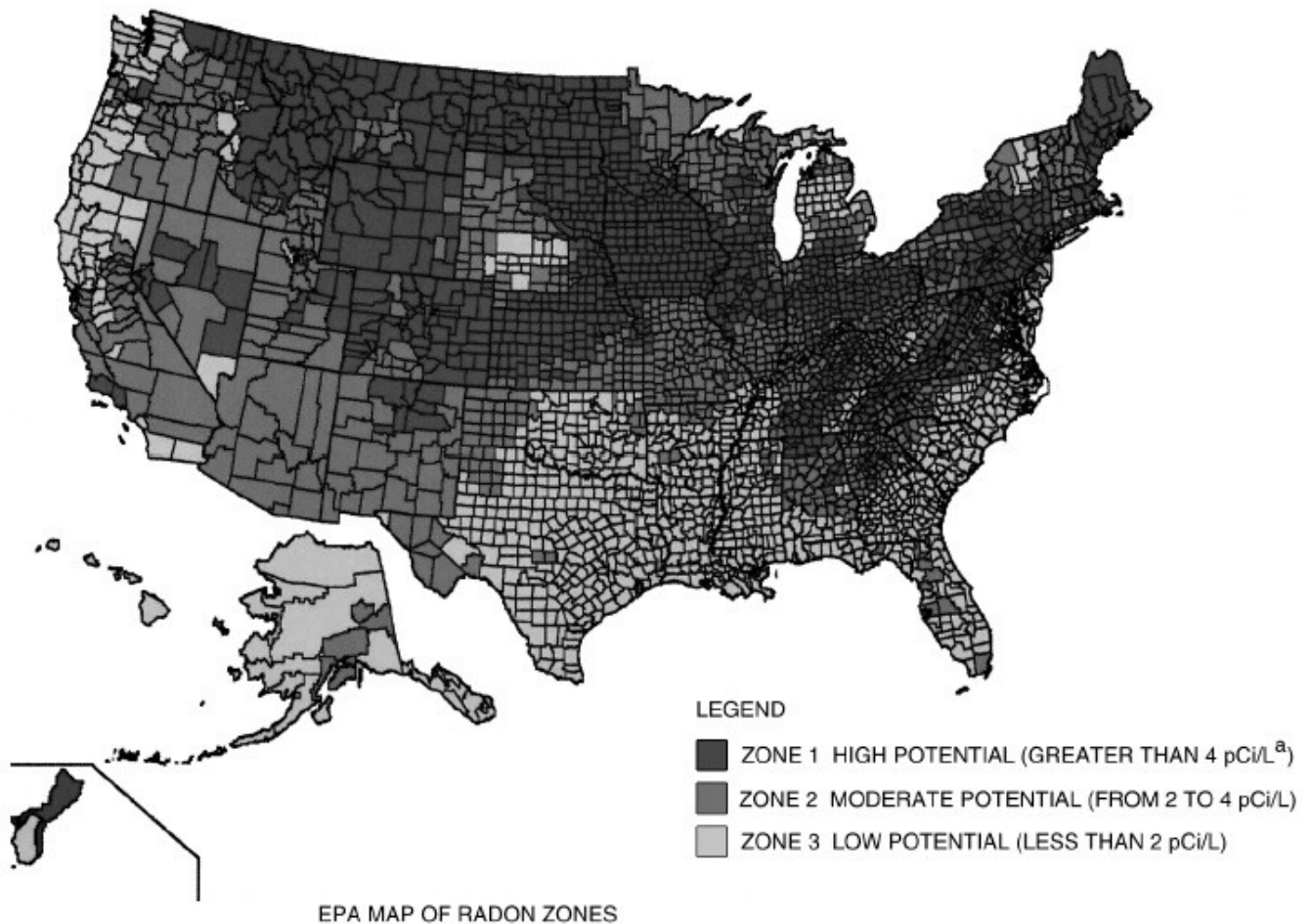


FIGURE B101.1 FIGURE 809.1
EPA MAP OF RADON ZONES

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.

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:

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 $1\frac{1}{2}$ -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 $\frac{3}{4}$ -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 $\frac{1}{8}$ 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 ~~B201.5.4~~ 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 ¹/₂ inch (12.7 mm).

~~B201.5.2~~ 809.2.5.2 Concrete joints. Slab joints, ²control 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 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Requiring all buildings to be equipped with radon systems would be prohibitive. This decision should be left up to the jurisdiction. It may, however, be appropriate as a jurisdictional elective.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Susan Gitlin, representing US Environmental Protection Agency (gitlin.susan@epa.gov); Mark Bishop, Healthy Schools Campaign (mark@healthyschoolscampaign.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 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
<u>809.1</u>	<u>Radon mitigation for buildings containing Group E occupancies that are located in Moderate Radon Potential areas</u>	<u>Yes</u>	<u>No</u>

(Portions of table not shown remain unchanged)

809.1 Radon mitigation. Buildings containing Group E occupancies that are located in areas of High and Moderate Radon Potential (Zone 1 and 2 greater than 4 pCi/L), as determined by approved data where available or otherwise as determined by Figure 809.1 and Table 809.1, shall comply with Sections 809.2.4 809.1 through 809.2.42 809.12. Where this section is indicated in Table 302.1 to be applicable to buildings containing Group E occupancies that are located in areas of Moderate Radon Potential (from 2 to 4 pCi/L), as determined by approved data where available or otherwise as determined by Figure 809.1 and Table 809.1, such buildings shall comply with Sections 809.1 through 809.12.

809.2.4-809.1.1 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.

809.2 MITIGATION PROCEDURES. Radon mitigation features shall be provided in accordance with Sections 809.2.1 through 809.2.12.

809.2.2 809.1.2 Subslab radon suction pit. *(No change to text)*

809.2.3 809.1.3 Radon vent piping. *(No change to text)*

809.2.3.4 809.1.3.1 Subslab suction pit horizontal vent pipe. *(No change to text)*

809.2.3.2 809.1.3.2 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 809.2.5 809.1.5.

809.2.4 809.1.4 Soil-gas-retarder. *(No change to text)*

809.2.5 809.1.5 Entry routes. Potential radon entry routes shall be sealed or closed in accordance with Sections 809.2.5.1 through 809.2.5.10 809.1.5.10.

809.2.5.1 809.1.5.1 Floor openings. *(No change to text)*

809.2.5.2 809.1.5.2 Concrete joints. *(No change to text)*

809.2.5.3 809.1.5.3 Drains. *(No change to text)*

809.2.5.4 809.1.5.4 Sumps. *(No change to text)*

809.2.5.5 809.1.5.5 Foundation walls. *(No change to text)*

809.2.5.6 809.1.5.6 Dampproofing. *(No change to text)*

809.2.5.7 809.1.5.7 Air-handling units. *(No change to text)*

809.2.5.8 809.1.5.8 Ducts. *(No change to text)*

809.2.5.9 809.1.5.9 Crawl space floors. *(No change to text)*

809.2.5.10 809.1.5.10 Crawl space access. *(No change to text)*

809.2.6 809.1.6 Passive submembrane depressurization system. *(No change to text)*

809.2.6.1 809.1.6.1 Ventilation. *(No change to text)*

809.2.6.2 809.1.6.2 Soil-gas-retarder. *(No change to text)*

809.2.6.3 809.1.6.3 Vent pipe. *(No change to text)*

809.2.7 809.1.7 Passive subslab depressurization system. *(No change to text)*

809.2.7.1 809.1.7.1 Vent pipe. *(No change to text)*

809.2.7.2 809.1.7.2 Multiple vent pipes. *(No change to text)*

809.2.8 809.1.8 Vent pipe drainage. *(No change to text)*

809.2.9 809.1.9 Vent pipe accessibility. *(No change to text)*

809.2.10 809.1.10 Vent pipe identification. *(No change to text)*

809.2.11 809.1.11 Combination foundations. *(No change to text)*

809.2.12 809.1.12 Power source. *(No change to text)*

Bibliography: National School Radon Survey Report to Congress, US Environmental Protection Agency, 1993

Commenter's Reason: Radon in schools presents significant health risk. In a national survey of radon levels in schools, it was determined that nearly 20% of the country's public schools had at least one classroom with high radon levels. The risk of health effects related to radon increases with length of exposure, so children and staff that spend many hours in these classrooms are put at higher risk.

Public Comment 2:

David Kapturowski, Spruce Environmental Technologies, Inc., representing American Association of Radon Scientists and Technologists requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

809.1 Radon mitigation. Buildings containing Group R2 occupancies that are located in areas of High and Moderate Radon Potential (Zone 1 and 2), as determined by approved local data or as determined by Figure 809.1 and Table 809.1 shall comply with Sections 809.2.1 through 809.2.12.

Commenter's Reason: This comment will limit the requirement for Radon Reducing features to the most important buildings; residential occupancies in the highest radon potential areas.

21,000 Americans die each year from radon-induced lung cancer. The primary source of exposure to radon for the general public is the home. Geographical areas of the highest radon potential are located in EPA zone 1.

Public Comment 3:

Bill Long, representing Environmental Protection Agency (long.bill@epa.gov) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

809.1 Radon mitigation. Buildings containing Group R-2 occupancies that are located in areas of High Radon Potential (greater than 4 pCi/L) and Moderate Radon Potential (Zone 1 and from 2 to 4 pCi/L), as determined by approved data where available or otherwise as determined by Figure 809.1 and Table 809.1, shall comply with Sections 809.2.1 809.1 through 809.12.

Commenter's Reason: This modification to GG267-14 targets radon mitigation in the highest risk areas. Radon mitigation systems reliably and routinely reduce radon to low levels. Radon is the leading environmental cause of cancer mortality in the US, and this modification will significantly reduce public exposure as well as protect the liability of property owners and managers.

GG267-14

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

Proposed Change as Submitted

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.

903.1.2 903.5 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	<u>Inspection and</u> report	With permit submittal	None	401.2
Landscape irrigation systems	X	None	Field inspection <u>and commissioning testing and report</u>	Installation <u>and testing</u>	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>	<u>Annually where 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>	<u>None</u>	
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 <u>O&M systems manual</u>	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 commissioning agent	commissioning initiation		
d. Balance HVAC systems (both air and hydronic)	X	X	HVAC system installer, <u>TAB</u> /contractor or <u>and</u> commissioning agent <u>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 commissioning agent <u>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 commissioning agent <u>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 commissioning agent <u>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- certificate of occupancy	Post-certificate of occupancy	
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- certificate of occupancy	Post-certificate of occupancy	
exposed to exterior environment.						
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

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:
- ~~3.42.1~~ 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:
 - ~~3.3.4 2.3.1~~ Exterior wall finishes.
 - ~~3.3.2~~ Roof coverings.
 - ~~3.3.32.3.2~~ 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:
- 4.43.1 Heating, ventilating and air-conditioning systems including:
 - 4.1.43.1.1 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:
 - ~~4.3.43.3.1~~ 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.
 - 4.43.1 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee disapproved the proposal based on the proponent's request and to be consistent with prior committee actions on GG271-14, GG276-14 and GEW142-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mari Hamasaki, Hamasaki Consulting Engineering Services LLC, representing self (mhamasaki@hces-llc.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

903.4 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 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 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 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. A final commissioning report shall be submitted to the owner or the owner's authorized agent within 30 days or in accordance with the owner's schedule after the seasonal commissioning and other commissioning items are closed out.

Commenter's Reason: Commissioning activities occur after occupancy in order to accommodate seasonal commissioning, warranty reviews occurring prior to the end of the contractors project warranty and closing out open commissioning issues. The final commissioning report revises the preliminary commissioning report to include these activities. Since the pre-certificate of occupancy commissioning report discussed in this paragraph is a preliminary report, I have added the final commissioning report requirements. A final report is essential to the successful completion of the building commissioning.

GG271-14

GG281-14

1001.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The Committee agreed with the proponent's published reason statement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Greg Johnson, Johnson & Associates Consulting Services, representing Greenscapes Alliance (gjohnsonconsulting@gmail.com) requests Disapprove.

Commenter's Reason: The committee approved this proposal based upon the proponent's reason, but that reason is founded on a flawed assumption regarding relocated buildings and sites. The reason asserted that relocated buildings automatically require new sites and that simply is not true.

It is very common for modular buildings intended for use as classrooms to be located and relocated on existing school grounds. It's also reasonably common for salvaged buildings to be relocated to already developed sites. For these circumstances full compliance with chapter 4 (predesign site inventory and assessment; storm water runoff; soil and water quality protection plan; walkways and bicycle paths; preferred vehicle parking; site hardscape; etc.) is extraordinarily onerous and should not be required.

Current code language specifically references chapter 11 for existing building sites which would govern buildings relocated to existing sites. Where existing buildings are relocated onto new sites those sites would already have to comply with chapter 4.

A reference to chapter 4 that trumps the reference to chapter 11 is therefore unneeded and unwise.

Finally, there is a basic problem with the language of the change. It requires buildings to comply with chapter 4 site provisions rather than sites with relocated buildings to comply with chapter 4. This literally does not make sense.

This change breaks a section of code that works perfectly well and therefore should be rejected.

GG281-14

GG283-14

1001.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This language is unnecessary, makes the section more cumbersome and creates a laundry list that may be incomplete.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Mike Fischer, CPI, representing The Center for the Polyurethanes Industry (mfischer@kellenccompany.com) requests Approve as Submitted.

Commenter's Reason: This proposal is necessary to demonstrate the intent of the IgCC regarding important life safety provisions in the building codes. Fire safety is established in the base codes; the IgCC must not reduce the level of safety.

Public Comment 2:

Marcelo Hirschler, GBH International, representing North American Flame Retardants Alliance (gbhint@aol.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 active or passive 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.

Commenter's Reason: As was discussed during the proposal hearings by the committee and other testifiers, this change introduces the necessary concepts that both active and passive fire protection measures must be maintained, while avoiding a laundry list.

GG283-14

GG289-14

1003.2, 1003.2.8 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee disapproved this proposal because envelope "components" is too broad a term and because the proposed language does not belong in this section of the code and it conflicts with Section 1003.2.6.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Garrett Stone, Energy Efficient Codes Coalition, representing Energy Efficient Codes Coalition (gas@bbrslaw.com); Maureen Guttman (mguttman@ase.org); Harry Misuriello, American Council for an Energy Efficient Economy (misuriello@verizon.net) request Approve as Modified by this Public Comment.

Modify the proposal as follows:

1003.2 Requirements for alterations. Alterations of portions or components of buildings shall comply with Sections 1003.2.1 through 1003.2.8.

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.

1003.2.8 Insulation and fenestration criteria ~~New building thermal envelope components~~ Insulation and fenestration products 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.

Commenter's Reason: We recommend that this proposal be Approved as Modified in accordance with this public comment. The proposed modifications address the Committee's concern that the reference to thermal envelope in the proposed language in 1003.2.8 is too broad. The revised proposal makes it even clearer that when new insulation or fenestration products are installed in the process of altering a building, those products must meet the thermal envelope requirements of Chapter 6 of the IgCC.

We disagree with the Committee that this section conflicts with Section 1003.2.6. That section requires the insulation of unconditioned attics. By contrast, the proposed 1003.2.8 is triggered only when new insulation or fenestration products are installed. In those cases, where the new products are going to be installed anyway, these products should meet the requirements of the IgCC.

GG289-14

GG290-14

1003.2, 1003.2.8 (New)

Proposed Change as Submitted

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.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1003.2 Requirements for alterations. Alterations of portions or components of buildings shall comply with Sections 1003.2.1 through 1003.2.8.

Exceptions:

1. The total cost of improvements required by Sections 1003.2.1 through 1003.2.8 shall not.....
3. Materials, assemblies and components regulated by Sections 1003.2.1 through 1003.2.8 that....
4. Alterations are not required to comply with the requirements of Sections 1003.2.1 through 1003.2.8 where.....

(Portions of proposal not shown are not modified)

Committee Reason: This makes the IgCC consistent with the IECC.

Assembly Motion:

Disapprove

Online Vote Results:

Failed - Support: 48.21% (81) Oppose: 51.79% (87)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Garrett Stone, Energy Efficient Codes Coalition, representing Energy Efficient Codes Coalition (gas@bbrslaw.com) requests Approve as Modified by Committee.

Commenter's Reason: We recommend that this proposal either be Approved As Submitted or Approved As Modified by the Committee for the reasons stated in the Committee Reason Statement and the original Reason Statement. Although we will not repeat the information already submitted, because the proposal was modified by the Committee, we thought it important to clarify how the modification will change the original proposal.

The fundamental intent of the proposal remains the same. Because of the impact of windows on building energy use, it is very important that replacement windows meet reasonable performance requirements in green construction. However, because the alterations requirements of the IgCC contain several exceptions, the Committee modification incorporates these exceptions into the fenestration replacement requirement. As with other components that are part of an alteration under IgCC Section 1003.2, replacement fenestration is not required to meet the requirements of Section 605.1.1 where: the total cost of improvements required under Section 1003.2 would exceed 10% (exception 1); materials or assemblies required depend on properties of concealed or unknown properties of materials or components and will not be revealed during construction (exception 3); or the code official determines that the alteration would be infeasible based on existing configuration of spaces (exception 4).

We do not expect that there will be widespread use of these exceptions, but having them in place may provide some clarity to the code official. The new Section 1003.2.8 only applies when new fenestration is already going to be installed, and it is unlikely that an IgCC-compliant window would create any new feasibility (exception 4) or "concealed or unknown properties" (exception 3) problems. Likewise the incremental efficiency improvement that may be required by IgCC Section 605.1.1 would be unlikely to significantly increase the costs (exception 1). Although the building code official typically has the latitude to approve alternative means and methods of meeting the code, these modifications specifically identify three scenarios in which the fenestration replacement requirements - and other thermal envelope requirements in alterations - may fall under an exception to the rule.

Public Comment 2:

Donald Surrena, National Association of Home Builders, representing National Association of Home Builders requests Disapprove.

Commenter's Reason: This proposed change requires replaced fenestration to exceed the 2015 IECC by 10% (605.1.1). How can this be accomplished for an existing building? An example is a 5 year old store front with one broken panel. The frame will not

accommodate the new requirements and the frame of the new glazing would not match existing conditions or the problems with replacing an IGU with broken glass or a broken seal that meets the 2012 IECC, but now needs to exceed the 2015 IECC by 10%, but this will require a different coating which has a different exterior appearance. Another example is stained glass windows. This proposal is a disincentive to commercial building owners to update their buildings except by doing so all at once. The circumstances for commercial buildings are far different than residential buildings. The language is taken directly from the residential portion of the IECC, it is not in the commercial portion of the IECC. The IECC is where this proposal should be proposed, not the IgCC.

I urge you disapprove this proposed change.

GG290-14

GG297-14

1003.2.7, 605.2.

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapprove

Committee Reason: The committee recommended this proposal be disapproved because the exception that the proposal strikes is important for older existing buildings without much insulation that need to be brought up to code.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mike Fischer, representing The Center for the Polyurethanes Industry (mfischer@kellencompany.com) requests Approve as Submitted.

Commenter's Reason: This proposal maintains the necessary exceptions to the requirements for additional insulation for roof replacements by requiring compliance with the base code (IECC) and importantly does not include an additional R-Value requirement above the base code. This provision recognizes the balance needed during certain building renovations. The proposal also maintains the needed reference to Chapter 10 to provide the connection between energy efficiency requirements and their application to existing buildings.

GG297-14

GG299-14

202 (New), 1003.2.7

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approve as Submitted

Committee Reason: The committee approved this proposal based on the addition of 2 beneficial definitions and the proponent's published reason statement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Mike Fischer, CPI, representing The Center for the Polyurethanes Industry (mfischer@kellenccompany.com) requests Approve as Submitted.

Commenter's Reason: This proposal is part of a group of related code proposals intended to clarify the base requirements for roof recovers and roof replacements. This proposal offers important clarifications on the application of the IgCC to roof recovers and roof replacements and how above-based code energy efficiency measures (i.e., increased R-value) should be applied to such building renovations.

Public Comment 2:

Jonathan Siu, City of Seattle, Dept of Planning & Development, representing Washington Association of Building Officials Technical Code Development Committee (jon.siu@seattle.gov) requests Disapprove.

Commenter's Reason: The sole purpose for adding the definitions is to say roofs are not required to be insulated if a roof is being recovered or repaired. These definitions and the added text to Section 1003.2.7 add unnecessary verbiage to the code:

1. Section 201.3 clearly says definitions in other I-codes (including the IBC) apply to the IgCC.
2. Roof repair, roof recover, and roof replacement (the subject of this section) are all defined in the IBC.
3. This section only applies to roof replacement. Adding the new verbiage could cause confusion that roof replacement includes roof repair or roof recover.
4. If it is felt there is confusion regarding whether a "roof recover" requires insulation when this section only requires it for a roof replacement, clarifying text can be added in the commentary.

GG299-14

GG302-14

1003.2.8 (New), 605.3 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapprove

Committee Reason: The committee recommended that this proposal be disapproved because it would create conflicts with the energy code. This proposal is essentially requiring that, when a roof is replaced, it must comply with the energy code. That is already required.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Amy Dickie, representing Global Cool Cities Alliance (amy@globalcoolcities.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

605.3 Roof recovering and roof replacement. Roof products ~~coverings~~ used to recover or replace roofs ~~roof coverings~~ 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 coverings used to recover or replace roofs roof coverings 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.

Commenter's Reason: The 2015 International Energy Conservation Code requires that alterations (Section C503) and repairs (Section C504) to any building comply with the requirements of the code for new construction. However, it also provides exceptions for "roof recoverings" for both alterations and repairs. Neither of these exemptions were noted at the Committee Action Hearing in Memphis when the Committee concluded that there was no need for GG302.

This proposal clarifies that because of the clear exemptions for roof recovering in the 2015 IECC, there is a specific need to ensure that roof recovering for existing buildings under the IgCC complies with the cool roof requirements of the 2015 IECC.

GG302-14

GG308-14

1006.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The Committee agreed with the proponent's published reason statement.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Martha VanGeem, representing self; Emily Lorenz, representing self (emilyblorenz@gmail.com) request Approve as Modified by this Public Comment.

Modify the proposal 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 building site and where the nonhazardous construction waste contains less than 1000 lbs of metals. Where the nonhazardous construction waste contains at least 1000 lbs of metals and the distance to the available recycling facilities from the building site is more than 75 miles, not less than 50% of the nonhazardous metals shall be diverted from disposal and a facility Construction Waste Management Plan shall be developed and implemented.

Commenter's Reason: This public comment requires diversion from landfill of at least 50% of metals when the distance to the recycling and salvage facility is less than 75 miles from the project site, if the amount of metals in the waste is more than 1000 lbs.

Metals such as steel, copper, and aluminum should always be recycled. The process to extract materials and process them to produce steel, copper, and aluminum has a significant environmental footprint. The energy used to transport these materials is small relative to the energy used to extract virgin metals. These materials are commonly recycled and the manufacturers of these materials depend on recycled materials as part of their supply chain.

The original proposal changed the criteria for recycling from a requirement regardless of distance to recycling facilities, to only being required if recycling facilities are within 75 miles, regardless of the type of facilities available within 75 miles.

<http://www.steel.org/Sustainability/Steel%20Recycling.aspx>

http://www.copper.org/publications/newsletters/innovations/1998/06/recycle_overview.html

<http://www.benefits-of-recycling.com/aluminumrecyclingprices/>

Public Comment 2:

Jonathan Humble, representing American Iron and Steel Institute (jhumble@steel.org) requests Disapprove.

Commenter's Reason: We ask for this proposal to be disapproved.

Point #1: Use of the phrase "adequate to reasonably" is subjective, and therefore raises the question of enforcement. Who makes this determination? The code official? The contractor? The building owner? Code officials require tangible regulations to enforce the code.

Point #2: Distance recommendedd is arbitrary and fails to address the issue of environmental protection by diverting the waste from landfills. By restricting the distance only reduces the effectiveness of the other recycling provisions in this code.

Point #3: If we examine both GG187-14 and GG308-14 we see a conflict. GG187-14 states that the diversion of material waste is required regardless if the location for collection is or is not within the 75 mile distance of the project. Whereas, GG308-14 outright exempts any material waste diversion if one or both of the exemptions are applicable. We feel there is no justification to differentiate in this case.

Examples:

GG187-14 states: Section 503.1 "...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...."

GG308-14 states: Section 1006.1 "...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....Exception-
#1 Where the scope of work is not adequate to feasibly separate materials, and #2 Where recycling facilities do not exist within 75 miles of a facility..."

GG308-14

GG309-14

1007.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproval

Committee Reason: The committee recommended that this proposal be disapproved because the proponent requested disapproval so that they can make improvements in the public comment period.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Maureen Traxler, City of Seattle Dept of Planning & Development, representing Seattle Dept of Planning & Development (maureen.traxler@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

1007.2 Evaluation and certification of existing buildings and building sites. Where this section is indicated to be applicable in Table 302.1, building owners are permitted to submit a permit application for the evaluation of an existing building and building site. The building official shall determine whether the building and building site comply with the requirements of this code as applicable to a new project. The evaluation shall be in accordance with the requirements of this section.

1007.2.1 Certificate of compliance. Where compliance the code official determines that the building and building site comply 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, shall issue a certificate shall be issued indicating compliance to this code, subject to as modified by the limitations contained in Sections 1007.2.2 through 1007.2.3.2.

Commenter's Reason: Chapter 3 allows jurisdictions to choose to do evaluations of existing buildings as a jurisdictional requirement. The proposed language more clearly ties Section 1007.2 to Table 302.1, using the same language that is used for other jurisdictional requirements, such as in Sections 402.2.2, 402.3, 409.1 and 604.1. The comment revises the section to more

clearly state that building owners may choose to have the code official determine whether their building complies with the IGCC as it would apply to a new building. If the code official examines the building, he will issue a certificate to the owner.

GG309-14

GG314-14

Table 302.1, 1007.4 (New)

Proposed Change as Submitted

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:</u> <u>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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee recommended that this proposal be disapproved. While the proposal may have admirable goals, it is not enforceable as written. It is unlikely that a jurisdiction will want to enforce these requirements after occupancy.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jim Edelson, New Buildings Institute, representing New Buildings Institute requests Approve as Modified by this Public Comment.

Modify the proposal 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.

Commenter's Reason: One of the Committee's concerns with GG314 was that the specification of the reporting year and the reporting date was too prescriptive. This comment deletes both of those provisions.

However, the Committee voted to Disapprove the proposal largely because they felt that it was unlikely that a jurisdiction would want to enforce this provision. While true, this is precisely why the provision is included as a jurisdictional elective. It is included for those jurisdictions that do want a provision like this, not for all jurisdictions.

Setting a minimum performance threshold is not appropriate for every jurisdiction - not every jurisdiction has the authority nor the policies to support it. However, many jurisdictions do have policy objectives that seek overall reductions in energy consumption. Recent data from disclosure laws and other databases indicate that the greatest opportunities for energy savings are available from the worst performing existing buildings within any building occupancy type. Specifically regulating those poorly performing buildings is a forward-looking concept, but the IgCC is a forward-looking code.

The code language in GEW314 provides the flexibility by which the actual EUI threshold is left for the jurisdiction to apply, so that the minimum energy performance level is appropriate for that jurisdiction's building stock. Approval of GEW314 as modified would ensure that jurisdictions interested in this type of requirement have national model code language to use and don't have to invent it themselves. This last issue is very important for building officials who must enforce the regulations their jurisdictions adopt. Having the GEW314 elective in the IgCC ensures that building officials in jurisdictions that are interested in measured energy performance regulations will have access to regulatory language that is vetted and comes with a level of national consistency.

GG314-14

GG 320-14

Appendix A (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal creates a contradiction to what is considered "green" in the body of the IgCC. It acts as a mask to what is considered "green" in the IgCC.

The code already offers a great deal of flexibility. That makes this alternative unnecessary.

Important information, such as that related to Chapter 8 and various requirements in Chapter 5 are not addressed by this proposal.

Assembly Motion:

Approved as Modified

Online Vote Results:

Successful - Support: 56.7% (127) Oppose: 43.3% (97)

Assembly Action:

Approved as Modified

Modify the proposal as follows:

A101.3 Scope.

Exceptions:

3. 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; Group R-3; as well as group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.

(Portions of the proposal not shown are not modified)

Individual Consideration Agenda

Public Comment 1:

Assembly Action requests Approve as Modified by Successful Assembly Action.

Commenter's Reason: This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action. The assembly action for Approve as Modified was successful by a vote of 56.7% (127) to 43.3% (97) by eligible members online during the period fo May 19 - May 30, 2014.

Public Comment 2:

Craig Conner, representing self (craig.conner@mac.com); Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Hope Medina, representing Colorado Chapter of ICC (HMedina@coloradocode.net); Terry Cobb, Director of Development Services, Metropolitan Nashville & Davidson County, TN, representing self (terry.cobb@nashville.gov); Tim Ryan, CEO, representing International Association of Building Officials (IABO), (tim.ryan@opkansas.org) request Approve as Modified by Successful Assembly Action.

Commenter's Reason: We support GG320 AM.

- GG320 AM is a simple, clear, usable green code in an appendix. It is an option.
- GG320 AM stays within the authority of the code official. It can be enforced.
- It is an overlay code. It does not repeat the other I-codes.
- It focuses on the building itself.
- It is quick and easy to adopt when the jurisdiction says "go green now".

--GG320 AM will not require heavy amendment. Or being adopted as a "voluntary code".

--GG320 AM won the Assembly Motion.

Please support GG320 AM. We need a green code that works.

Public Comment 3:

Proponents: Craig Conner, representing self (craig.conner@mac.com); Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com); Hope Medina, representing Colorado Chapter of ICC (HMedina@coloradocode.net); Terry Cobb, Director of Development Services, Metropolitan Nashville & Davidson County, TN, representing self (terry.cobb@nashville.gov); Tim Ryan, CEO, representing International Association of Building Officials (IABO), (tim.ryan@opkansas.org) request Approve as Modified by this Public Comment.

Modify the proposal as follows:

A703.5 Interior Material Emissions. A minimum of 85 percent of the following materials located within the air barrier of the building shall comply with this section:

1. Adhesives/sealants and architectural paints and coatings by weight or volume
2. Flooring, acoustical ceiling tiles and wall systems by square foot
3. Insulation

A703.5.1 Testing and VOC limits. The emissions limits shall be as specified by CDPH/EHLB/Standard Method V1.1 Standard Method for Testing VOC Emissions From Indoor Sources, dated February 2010, when tested in accordance to the same standard. Testing shall be done by a laboratory that has the CDPH/EHLB/Standard Method V1.1 test methodology in the scope of its ISO 17025 Accreditation.

A703.5.2 Deemed to comply. Ceramic tile, concrete tile, clay pavers, concrete pavers, concrete, metal, and organic-free mineral-based products shall be deemed to comply with VOC limits.

Commenter's Reason: This restores indoor air quality requirements to limit emissions in the Alternative IGCC. It utilizes tests and maximum emission levels already in the IGCC in the existing Sections 806.2 through 806.6. The text of the requirements is made more readable.

Public Comment 4:

Craig Conner, representing self (craig.conner@mac.com) request Approve as Modified by this Public Comment.

Modify the proposal as follows:

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.

A302.1 Protected areas. Agricultural 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. 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.

A304.2.2 Description of spaces. Bicycle parking spaces shall comply with the following:

1. Shall Horizontal parking spaces shall have an floor area of not less than 18 inches (457 mm) by 60 72 inches (1524 1829 mm) per bicycle;
2. Vertical parking spaces shall have a floor area of not less than 18 inches (457 mm) by 44 inches (1118 mm) per bicycle with not less than 24 inches (610 mm) of clearance above the highest point of the bicycle rack;
3. Shall be provided with a rack or other facility for locking or securing each bicycle.

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 designated 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 at 80 psi
Lavatory faucet and bar sink-private	1.6 gpm at 60 psi
Lavatory faucet-public (metering)	0.25 gpc ^b at 60 psi
Lavatory faucet-public (non-metering)	0.5 gpm at 60 psi
Kitchen faucet-private	2.2 gpm 1.8 gpm at 60 psi ^f
Kitchen and bar sink faucets in other than dwelling units and guest rooms	2.2 gpm at 60 psi
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 ^e
Drinking Fountains (metered)	0.25 gpc ^{b,e}

- 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.
e. Bottle filling stations associated with drinking fountains shall not have limitations for flow rate.
f. Where a faucet has a pot filler mode, the flow shall not exceed 2.2 gpm at 60 psi. Such faucets shall automatically return to 1.8 gpm when the pot filler mode activation mechanism is released or when the faucet flow is turned off.

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.

Commenter's Reason: These changes are made to be consistent with several changes to the IgCC that were recommended for approval at the Committee Action Hearings in Memphis. This comment does not make any major changes to GG320.

Rationale for each change is as follows:

Delete Fees in Section A107--To be consistent with GG36, which was recommended for approval at the Committee Action Hearings, this deletes the fees section. Any fees would be associated with the code under which the permit was issued.

Restore part of sentence in A302.1-- Half of one sentence was left out of the section in the printed code change. This restores the complete sentence.

Update bicycles space description in A304.2.2-- To be consistent with two approved changes. GG146 increased the size for bike parking spaces. GG148 added the dimensions for vertical bike storage as an option.

Delete nonwater urinals in A602.4-- To be consistent with the text of GEW155, which was recommended for approval at the Committee Action Hearings.

Update fixture flow rates-- The flow rates in Table A602.1(1) were modified to be consistent with GEW151, which was recommended for approval at the Committee Action Hearings. The pressure at which flow rate is measured was specified for the maximum flow rates. Higher flow rates for bottle filling at drinking fountains and pot filling modes of faucets were added.

The goal of GG320 remains to add a usable and optional green code as an IgCC appendix.

Public Comment 5:

Jay Crandell, Applied Building Technology Group LLC, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

A501.3 Application. Buildings shall be designed and constructed in accordance with the International Energy Conservation Code and the additional requirements of Section A501.3.1 or A501.3.2 as applicable to the method of compliance.

A501.3.1 Additional requirements for prescriptive path. All of the following prescriptive improvements to referenced prescriptive requirements of the International Energy Conservation Code shall be implemented and not used as a basis for trade-off of other requirements:

1. Additional Energy Efficiency Package Options – Comply with at least two of the listed options in Section C406.1 of the International Energy Conservation Code.
2. Enhanced Building Thermal Envelope: Comply with one of the following options:
 - 2.1. R-value Method – Where used, component R-values in Table C402.1.3 of the International Energy Conservation Code shall be multiplied by 1.1 and fenestration U-factors and SHGCs in Table C402.4 of the International Energy Conservation Code shall be multiplied by 0.9;

- 2.2. U-Factor Method – Where used, U-factors, C-factors, and F-factors in Table C402.1.4 of the International Energy Conservation Code and fenestration U-factors and SHGCs in Table C402.4 of the International Energy Conservation Code shall be multiplied by 0.9; or
- 2.3. Component Performance Alternative – Where Section C402.1.5 of the International Energy Conservation Code is used as a basis for compliance, insulation and fenestration values complying with item 'b.' above shall be used in the required calculations.
3. Enhanced Air-Leakage Control -- The building or representative portions of the building shall be tested for air-leakage in accordance with Section C402.5 of the International Energy Conservation Code. Where the tested air-leakage rate exceeds a target maximum of 0.25 cfm/ft² (1.25 L/s-m²), corrections to the building envelope shall be made to reduce the excess air leakage by at least 50 percent as confirmed by an additional test.

A501.3.2 Additional requirement for total building performance path. The proposed building energy cost shall be equal to or less than 75 percent of the standard reference design building instead of 85 percent as required by Section C401.2, Item 3 of the International Energy Conservation Code.

Commenter's Reason: The concept of providing a greatly simplified alternative appendix to the IgCC is worthy to consider only if it does not eliminate one of the most significant components of sustainability or "green" construction. Buildings represent 40% of the energy use in the US. The amount of energy and environmental impact this represents is staggering over the life of each building and especially the entire building stock. There is plenty of room to continue to improve over the current IECC 2015 base code requirements and no shortage of solutions already in practice to support reasonable incremental improvements as proposed in this public comment.

The stronger solution to the concern of adoptability and simplicity of the IgCC is not to remove improved energy efficiency from consideration, but rather to find a way to do it in a way that over-lays in a simple manner with provisions already in the base code and without creating new provisions or procedures that only add confusion and enforcement challenges. Despite taking the position of eliminating energy efficiency improvements, the reason statement in the original proposal alludes to a simple over-lay approach for improved energy efficiency in the following quote:

"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."

This public comment gives jurisdictions just such an approach. It uses and relies on the prescriptive and performance provisions in the IECC in a manner that makes improved energy efficiency easy to implement and enforce. For example, the prescriptive path R-value solutions rely on and scale from solutions already in the IECC. Similarly, the full flexibility of the U-factor method and component performance alternative (UA calculation method) also are maintained simply by a percentage increase in the values used. In addition, the simplicity of the performance path method is maintained by a simple change to the existing percentage difference from the baseline building performance already required in the IECC. Each of these solutions for the prescriptive path and performance path are intended to achieve an approximate 10% improvement in energy efficiency using practices that are already required and familiar. Finally, each of these improvements strive to make a simple "one-sentence" reference to alter existing provisions in the IECC which are "understandable by all".

Public Comment 6:

David Collins, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com) requests Disapprove.

Commenter's Reason: As an original coordinating sponsor of the IgCC, the American Institute of Architects (AIA) strongly opposes GG-320 and urges ICC voting members to disapprove it as the Committee did in Memphis in May. This code change proposal undermines the scope and purpose of the IgCC as envisioned by the ICC board and a fundamentally important principle of sustainability cited in this document by essentially eliminating all additional energy conservation and efficiency requirements beyond those of the 2012 IECC.

Like other companion codes in the ICC series, the IgCC contains provisions intended to provide a great deal of flexibility and promote innovative approaches for energy-efficient design. GG-320 would create a contradiction with the code's well established and clearly stated intent to create higher performance thresholds and meeting or exceeding the minimum requirements of the other I-Codes. Furthermore, important information related to various requirements in the material resource and indoor environmental quality chapters are not addressed by this proposal, creating a disconnect between major sustainable design concepts and a hole in the code that amounts to making it unusable for its intended purpose.

We urge the members to sustain the Committee's recommendation to disapprove this change.

Public Comment 7:

Maureen Traxler, representing Seattle Dept of Planning & Development (maureen.traxler@seattle.gov) requests Disapprove.

Commenter's Reason: While we appreciate the proponents' attempt at simplifying the IGCC, we find too many flaws to approve the proposal. An appendix containing a simplified version of the IGCC is an appealing idea but if the appendix proposed by GG320 is to be adopted, the following items, at a minimum, should be corrected.

• Several sections require construction documents to include information that doesn't relate to any code requirements. For example,

- A302.1 requires the construction documents to show the location of protected areas and required buffers but the proposal doesn't require buffers or protection of any areas.

- A302.2 requires the construction documents to identify what soil and vegetation are going to be protected, but the proposal doesn't have any requirements for protection of soil or vegetation.
- The proposal gives the code official broad, undefined discretion in several sections which makes the code difficult for the code official to enforce and difficult for property owners to know how to comply. For example:
 - The definition of "preferred plant species" includes any species "judged beneficial."
 - A302.2's exception requires approval of alternates that are "appropriate to the location and the species of the trees and shrubs." How is that determined?
 - A303.1 exception states that the code official can deem compliance with the section impractical. What are the criteria for "impractical"?
 - A304.2.1 exception 2 gives the building official authority to reduce the number of required bike parking spaces "due to building site characteristics including, but not limited to, isolation from other development." What does "isolated from other development" mean? How is it decided what other site characteristics justify fewer bike parking spaces?
- A302.1 starts with an incomplete sentence "Agricultural lands, flood hazard areas, conservation areas, greenfields, brownfields, sites adjacent to surface water bodies and wetlands." We assume a requirement was meant to follow, but what is it?
- A302.2 doesn't require protection of plants, trees and shrubs but it tell us how to protect them.
- The exception to A302.2 uses circular logic. "Approved [which is defined as acceptable to the code official] alternative perimeters appropriate to the location and the species of the trees and shrubs shall not be prohibited." In other words, the code official can't prohibit an alternate perimeter that she's approved.
- A302.3 requires that topsoil stockpiles be protected "throughout the project." Does that mean throughout the entire site, or during the time construction is going on?
- A302.6 requires rainfall equal to the "95th percentile rainfall event" to be managed but the proposal doesn't define "95th percentile rainfall event".
- A302.5 has requirements for pervious and permeable pavement materials. However, it doesn't have any provisions that would require the use of those materials.
- A304.2.1 specifies the number of required bike parking spaces but doesn't specify whether it's the number per building, or per site. It allows parking spaces for multiple buildings to be combined but doesn't specify proximity of the buildings to the parking spaces, and seems to allow the buildings to be blocks or miles apart. For example, people often use bikes to get around large university campuses. This proposal would allow all the parking spaces to be in one place.
- A402.1 requires that the amount of construction waste material be documented. It doesn't say what information is required in the documentation, or what to do with the documentation. Presumably it should be submitted to the code official, but it would be hard to enforce this provision without more specifically stated requirements.
- A402.1.2 & .4 both require that hazardous waste be handled in accordance with laws applicable in the jurisdiction. These sections are doubly redundant. They are identical with each other, and duplicate the other laws that already govern hazardous waste.
- Section A501 is unnecessary. The only requirement is compliance with the IECC which is one of the codes the IGCC overlays. Section A102.4 of the proposal already requires compliance with the IECC.
- A703.1.1 covers a topic that is adequately covered in the IMC and IFGC. The provisions in the proposal only create a potential for conflicts among the codes.

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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

Proposed Change as Submitted

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~~ A102.1 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
<u>A104.6</u>	<u>Mixed use development</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A104.7</u>	<u>Changing and shower facilities</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A104.8</u>	<u>Long term bicycle parking and storage</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A104.9</u> <u>A104.9.1</u> <u>A104.9.2</u> <u>A104.9.3</u> <u>A104.9.4</u>	<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
<u>A105.1</u>	<u>Waste management</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A105.2</u>	<u>Construction waste landfill maximum</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A105.3(1)</u>	<u>Reused, recycled content, recyclable, bio-based and indigenous materials (70%)</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A105.3(2)</u>	<u>Reused, recycled content, recyclable, bio-based and indigenous materials (85%)</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A105.4</u>	<u>Service life plan</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A105.5</u>	<u>Design for deconstruction and building reuse</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A105.6</u>	<u>Existing building reuse</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A105.7</u>	<u>Historic building reuse</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A106.1</u>	<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
<u>A106.2</u>	<u>Mechanical systems project elective</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u>A106.3</u>	<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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason:

The proposal simplifies and offers more choices for compliance.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Kathleen Petrie representing City of Seattle, Department of Planning and Development (kathleen.petrie@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

A103.2 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 A103.2 from Table A103.2. 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. 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.

**TABLE A103.2(1)
PROJECT ELECTIVES**

Section	Description	Owner Jurisdiction Selections
<u>A103.2</u>	<u>The jurisdiction shall indicate the minimum total number of project electives that must be satisfied. The number shall be equal to or greater than 3</u>	_____
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

(Portions of table not shown remain unchanged)

Commenter's Reason: The proponent identifies some very sound points in their reason statement as to why the minimum number of project electives should be limited to 3. Merging the 5 separate tables (Site, material, energy, water, and Indoor Environmental

quality) into one table resolves some of the issues identified. However, it should be a decision of the jurisdiction and not the applicant (as currently proposed) whether the minimum number of project electives should be greater than 3. The project elective section is in the appendix and not the body of the code, so it seems more in line with the intent of the IGCC to reduce the barriers for green building where jurisdictions have already made this a priority.

Public Comment 2:

Kathleen Petrie representing City of Seattle, Department of Planning and Development (kathleen.petrie@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

A103.2 Required number of and selection of project electives. A total of not less than 3 project electives shall be selected by the owner from Table A103.2 . 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.~~

Commenter's Reason: This public comment deletes the requirement for the jurisdiction to attach a completed copy of Table A103.2 with the C of O. The table has already been submitted by the owner, so it does not seem necessary for the jurisdiction to expend time and resources on returning copies to the owner.

Public Comment 3:

Rebecca Quinn, representing RCQuinn Consulting on behalf of Federal Emergency Management Agency (rcquinn@earthlink.net) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

A103.2 Required number of and selection of project electives. A total of not less than 3 *project electives* shall be selected by the owner from Table A103.2 . 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.

**TABLE A103.2
PROJECT ELECTIVES**

Section	Description	Owner Selections
A104.1.1	Flood hazard area preservation	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.1.2 A104.1.2	Flood hazard area minimization	<input type="checkbox"/> Yes <input type="checkbox"/> No
A104.1.3 A104.1.3	Flood hazard area, existing building	<input type="checkbox"/> Yes <input type="checkbox"/> No

(Portions of table not shown remain unchanged)

Commenter's Reason: In the top row of Table A103.2, there are three rows each of which should have associated yes/no checkboxes in the right hand column.

Also in the top row, two of the section numbers are shown incorrectly: A101.1.2 should be A104.1.2 and A101.1.3 should be A104.1.3.

Public Comment 4:

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

Commenter's Reason: The reason statement of the original code change proposal says: "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....The jurisdiction is required to indicate all project electives it has verified and approved in the far right column of the table." Neither the structure of Table A103.2 nor language of Section 103.2 of the initial code change proposal reflects the intent described in the reason statement and makes the scope of the proposal unclear.

GG322-14

GG327-14

A103, A106.2.2.1, A106.2.5, A106.3.3

Proposed Change as Submitted

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, an 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 fuels 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

Public Hearing Results

Committee Action:

Approved as Submitted

This code change proposal was heard by the IgCC Energy/Water Committee.

Committee Reason: The committee earlier approved related provisions for the main part of Chapter 6 as part of the Auto DR system. This project elective would build on the earlier standard and provides for increased efficiency when using renewable energy sources.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Ted Williams, American Gas Association, requests Disapprove.

Commenter's Reason: Grid-Interactive Electric Thermal Storage (GETS) is a term of art and is not sufficiently defined in proper standards for technology and equipment. The IgCC should not promulgate definitions for a broad range of technologies for which limited or no standardized definitions exist. With respect to electric storage water heaters, GETS-type systems, controls are not covered by national consensus standards and provide great opportunities for abusive operating practices at odds with load control goals. All GETS-type electric storage water heaters provide a consumer override of load control functions that may render grid-interactive load control obsolete. Until standards coverage of these functions is addressed, a discrepancy exists between how that appliance "ought to" be operated and how it is "will" be operated. Beyond GETS-type electric storage water heaters, whose baseline efficiency is covered by Federal minimum efficiency standards, other types of thermal storage systems are not covered by any national consensus standards in terms of their design or operation. Clearer definition of these technologies is needed and standards coverage developed before model codes "define" those technologies. Additionally, the restriction of thermal storage systems to electric thermal storage is unduly restrictive since thermal storage, even to alleviate peak electrical demands, need not be electricity powered.

GG327-14

GG328-14

A106.2.2.1, A106.2.2.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

A106.2.2.1 Heating equipment. For heating equipment, the part-load, ~~the full load, annual, or season~~ efficiency of the equipment shall be not less than 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, ~~full load, annual, or seasonal~~ efficiency of the equipment shall be not less than 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.

This code change proposal was heard by the IgCC Energy/Water Committee

Committee Reason: The modifications were approved to result in editorial consistency through the sections. The overall proposal is an adjustment to the project electives reflecting the substantial increases established for HVAC equipment. These increases are

reflected in the 2015 IECC. In addition, many equipment types do not have a part load metric available to evaluate against. This provides other metrics.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Ted Williams, American Gas Association requests Disapprove.

Commenter's Reason: Allowing a 5 percent variance for part load efficiency from full load efficiency promotes inefficient equipment that may frequently operate at part load. Since rated efficiencies do not capture part load efficiency, consumers and the public would be misled regarding the efficiency of such equipment. Such discounting of efficiencies should be addressed by energy efficiency standards and not made part of a green building code.

GG328-14

GG334-14

Appendix B

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: There is no need to have duplicated code text between codes.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

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

Commenter's Reason: The radon mitigation provisions in Appendix B were written to address the design, operating characteristics, and complexities of schools and other commercial buildings; e.g., a commercial mitigation system may require a larger diameter vent pipe than those used in residential construction, and may need multiple vent fans.

Appendix B, therefore, does not duplicate the radon mitigation measures in IRC, and should be retained.

GG334-14

GG338-14

Appendix E (New)

Proposed Change as Submitted

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

		TYPE OF CONSTRUCTION					
		Type I		Type II	Type III	Type IV	Type V
		A	B	A	A	HT	A
	HGT (feet)	UL	160	65	65	65	50
GROUP	STORIES (S)						
	Area (A)						
A-1	S	UL	5	3	3	3	2

		TYPE OF CONSTRUCTION					
		Type I		Type II	Type III	Type IV	Type V
		A	B	A	A	HT	A
	HGT (feet)	UL	160	65	65	65	50
GROUP	STORIES (S)						
	Area (A)						
	A	UL	UL	15,500	14,000	15,000	11,500
A-2	S A	UL UL	11 UL	3 15,500	3 14,000	3 15,000	2 11,500
A-3	S A	UL UL	11 UL	3 15,500	3 14,000	3 15,000	2 11,500
A-4	S A	UL UL	11 UL	3 15,500	3 14,000	3 15,000	2 11,500
A-5	S A	UL UL	UL UL	UL UL	UL UL	UL UL	UL UL
B	S A	UL UL	11 UL	5 37,500	5 28,500	5 36,000	3 18,000
E	S A	UL UL	5 UL	3 26,500	3 23,500	3 25,500	1 18,500
F-1	S A	UL UL	11 UL	4 25,000	3 19,000	4 33,500	2 14,000
F-2	S A	UL UL	11 UL	5 37,500	4 28,500	5 50,500	3 21,000
H-1	S A	1 21,000	1 16,500	1 11,000	1 9,500	1 10,500	1 7,500
H-2 ^d	S A	UL 21,000	3 16,500	2 11,000	2 9,500	2 10,500	1 7,500
H-3 ^d	S A	UL UL	6 60,000	4 26,500	4 17,500	4 25,500	2 10,000
H-4	S A	UL UL	7 UL	5 37,500	5 28,500	5 36,000	3 18,000
H-5	S A	4 UL	4 UL	3 37,500	3 28,500	3 36,000	3 18,000
I-1	S A	UL UL	9 55,000	4 19,000	4 16,500	4 18,000	3 10,500
I-2	S A	UL UL	4 UL	2 15,000	1 12,000	1 12,000	1 9,500
I-3	S A	UL UL	4 UL	2 15,000	2 10,500	2 12,000	2 7,500
I-4	S A	UL UL	5 60,500	3 26,500	3 23,500	3 25,500	1 18,500
M	S A	UL UL	11 UL	4 21,500	4 18,500	4 20,500	3 14,000
S-1	S A	UL UL	11 48,000	4 26,000	3 26,000	4 25,500	3 14,000
S-2 ^{b, c}	S A	UL UL	11 79,000	5 39,000	4 39,000	5 38,500	4 21,000
U ^c	S	UL	5	4	3	4	2

GROUP	TYPE OF CONSTRUCTION						
	Type I		Type II	Type III	Type IV	Type V	
	A	B	A	A	HT	A	
	HGT (feet)	UL	160	65	65	65	50
	STORIES (S) Area (A)						
	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 in 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 ^a	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 ^a	N	2	2	2	1	2	NP	4	3
E ^a	—	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

<u>H-3, H-4, H-5</u>	=	=	=	=	=	=	=	=	N
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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

<u>ROOM OR AREA</u>	<u>SEPARATION AND/OR PROTECTION</u>
<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. 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</u>	<u>1 hour</u>

square feet	
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	1-hour in Group B, F, M, S and U occupancies. 2-hours in Group A, E, I and R occupancies.

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

<u>BUILDING ELEMENT</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>B</u>	<u>A</u>	<u>B</u>	<u>HT</u>	<u>A</u>	<u>B</u>
Primary Structural Frame ^{a,h}	3 ^b	2 ^b	1	NP	1	NP	HT	1	NP
Bearing Walls									
Exterior ^{f,g}	3	2	1	NP	2	NP	2	1	NP
Interior	3 ^b	2 ^b	1	NP	1	NP	1/HT	1	NP
Tenant Separation	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>								
Residential spaces									
Non-residential spaces									
All tenant spaces									
Non-bearing Walls and Partitions	See Table 602 of the <i>IBC</i>								
Exterior									
Non-bearing Walls and Partitions ^e	0	0	0	NP	0	NP	See Section 602.4.6 of the <i>IBC</i>	0	NP
Interior									
Floor Construction and Secondary Members ^h	2	2	1	NP	1	NP	HT	1	NP
Roof Construction and Secondary Members ^h	1-1/2 ^b	1 ^{c,d}	1 ^{c,d}	NP	1 ^{c,d}	NP	HT	1 ^{c,d}	NP

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

a. The requirements in this table take precedence over Table 601, *Fire resistance rating for building elements* of the *International Building Code*.

b. 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.

c. 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.

- d. In all occupancies, heavy timber shall be allowed where 1-hour or less fire-resistance rating is required.
- e. Not less than the fire-resistance rating required by other Sections of the *International Building Code*.
- f. Not less than the fire-resistance rating based on fire separation distance (see Table 602 of the *International Building Code*).
- g. Not less than the fire-resistance rating as referenced in Section 704.10 of the *International Building Code*, *Exterior structural elements*.
- h. 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 ^a	Unprotected (UP)	10%
	Protected (P)	25%
10 to less than 15 ^{1,a}	Unprotected (UP)	15%
	Protected (P)	45%
15 to less than 20 ^{1,a}	Unprotected (UP)	25%
	Protected (P)	75%
20 to less than 25 ^{1,a}	Unprotected (UP)	45%
	Protected (P)	No Limit
25 to less than 30 ^{1,a}	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 son 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

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, E, H-4, I, R-1, R-2, U	<u>3</u>
F-1, H-3 ^a , H-5, M, S-1	<u>3</u>
H-1, H-2	<u>4^a</u>
F-2, S-2, R-3, R-4	<u>2</u>

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

<u>GROUP</u>	<u>EXIT ENCLOSURES AND EXIT PASSAGEWAYS^a</u>	<u>CORRIDORS</u>	<u>ROOMS AND ENCLOSED SPACES^b</u>
<u>A-1, A-2</u>	<u>A</u>	<u>A</u>	<u>B</u>
<u>A-3, A-4, A-5</u>	<u>A</u>	<u>A</u>	<u>C</u>
<u>B, E, M, R- 1, R-4</u>	<u>A</u>	<u>B</u>	<u>C</u>
<u>F</u>	<u>B</u>	<u>C</u>	<u>C</u>
<u>H</u>	<u>A</u>	<u>A</u>	<u>B</u>
<u>I-1</u>	<u>A</u>	<u>B</u>	<u>B</u>
<u>I-2, I-3, I-4</u>	<u>A</u>	<u>A</u>	<u>B</u>
<u>R-2</u>	<u>B</u>	<u>B</u>	<u>C</u>
<u>R-3</u>	<u>A</u>	<u>C</u>	<u>C</u>

S	B	B	C
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 Group 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 of 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

OCCUPANCY	DISTANCE (ft)
<u>A, E, F-1, M, R, S-1</u>	<u>200</u>
<u>I-1, I-2</u>	<u>200</u>
<u>B</u>	<u>200</u>
<u>F-2, S-2, U</u>	<u>300</u>
<u>H-1</u>	<u>75</u>
<u>H-2</u>	<u>100</u>
<u>H-3</u>	<u>150</u>
<u>H-4</u>	<u>175</u>
<u>H-5</u>	<u>200</u>
<u>I-3, I-4</u>	<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*.

E108.2Exterior 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.

E108.2.1Vinyl 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.

E108.2.2Fire 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.

E108.3Exterior 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.

E108.3.1Hail 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</u>	
				<u>I_g 0.2 Spectral Response</u>	
				<u>$\leq 0.40 g$</u>	<u>$> 0.40 g$</u>
<u>I</u>	0.95	0.95	1.20	1.00	1.20
<u>II</u>	1.20	1.20	1.20	1.00	1.20
<u>III</u>	1.25	1.40	1.15	1.25	1.40

IV	1.30	1.40	1.15	1.50	1.65
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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®

IWUIC – 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 approaches were 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

In Millions of 2010 Dollars per Decade

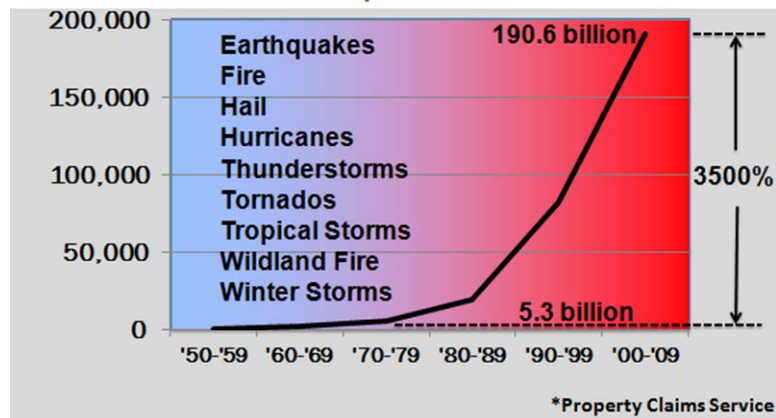
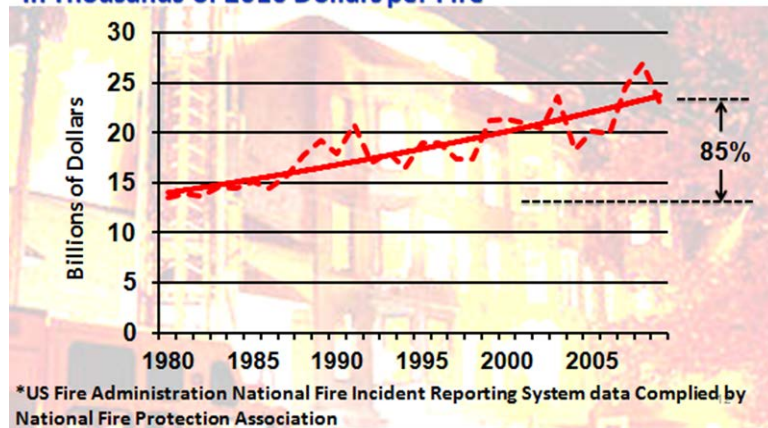


Figure 2 Increase in Fire Losses Per Structure Fire

In Thousands of 2010 Dollars per 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:

SourceFederal 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal is in conflict with the IBC. As the IgCC is intended to be an overlay code to the other I-codes, this code should not circumvent the requirements of other I-Codes. Resiliency is a part of sustainability, however, that needs to be considered in the base I-codes, not in the IgCC.

Assembly Action:

None

Analysis: For staff analysis of the content of ASCE/SEI 24-13, ASTM D4226-11, E108-11, D5206-13, FM 4473-11, NFPA 13-13, NFPA 13R-13, NFPA 221-15, UL 790-04 and UL 2218-2010 relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Stephen Skalko, Stephen V. Skalko, P.E. & Associates LLC, representing Portland Cement Association requests Approve as Submitted.

Commenter's Reason: The reasons given by the International Green Construction Code General Committee for recommending Disapproval of GG338 state:

"The proposal is in conflict with the IBC. As the IgCC is intended to be an overlay code to the other I-codes, this code should not circumvent the requirements of other I-Codes. Resiliency is a part of sustainability, however, that needs to be considered in the base I-codes, not in the IgCC."

The reason statement provided is flawed and does not substantiate the Committee recommendation. The following summarizes the errors in the committee reason statement:

1. The committee states "the proposal is in conflict with the IBC".

In no instance do the provisions established in GG338 create any conflict with the requirements of the IBC. The provisions in GG338 either match the requirements in the IBC but place additional limits on their application to buildings, or, they follow the same format of the requirements in the IBC but increase the stringency for buildings. The technical content of GG338 is structured to be an enhancement to the minimum requirements in the IBC.

2. The committee states "the IgCC is intended to be an overlay code to the other I-codes, this code should not circumvent the requirements of other I-Codes".

Consistent with the Scope of the IgCC the provisions in GG338 are structured to be an overlay to the IBC and do not circumvent the requirements of the IBC. For instance, GG338 modifies the Importance Factors used for the structural design of buildings for impact from snow, ice, wind and seismic loads. These importance factors are increased to enhance structural resistance to these events. Similarly, GG338 requires buildings and building components to be provided with fire resistances to enhance the building's capability to resist damage from fire events.

Having technical provisions in the IgCC to enhance the base I-Codes, like that embodied in GG338, already exist in the IgCC. As an example, Section 605.1.1 of the IgCC requires the building thermal envelope to exceed the requirements of Tables C402.1.2 and C402.3 of the International Energy Conservation Code by not less than 10%. Thus the IgCC enhances energy conservation features of the building thermal envelope requirements of the IECC by a factor of 1.10. This increased stringency is an overlay to the IECC and does not circumvent the IECC requirements.

Consistent with the provisions in Section 605.1.1 of IgCC, the provisions of GG338 become an overlay to the minimum requirements in the IBC. And, like Section 605.1.1, the provisions of GG338 do not circumvent the requirements in the IBC.

3. The committee states "resiliency is a part of sustainability, however, that needs to be considered in the base I-codes, not in the IgCC".

Similar resilient provisions to those in GG338 have already been considered in the code change process for the base I-codes (i.e. the IBC). These proposals were submitted to become an optional appendix in the IBC during the code change cycle for the 2015 edition but were disapproved. Members of the IBC Code Development Consensus Committees suggested that these types of criteria, because they are beyond minimum building code, be addressed in the International Green Construction Code. Thus, the provisions of GG338 have already been considered in the base I-code process and, based on recommendations of IBC Committee members, are again submitted to the IgCC as the appropriate venue.

By the IgCC General Committee statement, "resiliency is a part of sustainability", the Committee acknowledges the concepts in GG338 are consistent with those embodied in the IgCC. And, since the provisions in GG38 are; (1), not in conflict with the IBC; (2) do not circumvent the provisions of the IBC; and (3) are structured to be an overlay to the IBC (i.e. like the energy conservation provisions of the IgCC overlay the IECC), G338 should be APPROVED AS SUBMITTED.

GG338-14

GEW1-14

Chapter 6, 302.1.1, 302.1, 903.1, 904.3, 1007.3, 1007.3.1, 1007.3.2, 1007.3.3, 1007.3.3.1, 1007.3.3.2, 1007.3.3.3, A106

Proposed Change as Submitted

Proponent: Shaunna Mozingo, Colorado Code Consulting, LLC, representing Colorado Chapter of ICC, Inc (smozingo@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 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 CO ₂ e 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	Subsequent to completion of all commissioning	None	611.1

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST- OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
			owner	activities		
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

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST- OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCED STANDARD
				Preoccupancy	Post-occupancy	
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)

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The Committee was opposed to removal of Chapter 6 regulating energy conservation from the IgCC. Even if jurisdictions choose to not adopt one chapter or another, the IgCC needs to contain the full complement of topics. If the code doesn't contain a chapter on energy conservation, there is no chapter available for adopting jurisdictions to consider. The general topic areas regulated in the IgCC need to remain consistent with the ICC 700

Assembly Motion:

Approved as Submitted

Online Vote Results:

Failed - Support: 50% (97) Oppose: 50% (97)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Mark Nowak, representing Steel Framing Alliance requests Approve as Submitted.

Commenter's Reason: The current language in the IgCC requires the use of three different documents to enforce a performance compliance approach vastly different than the methods required under the IECC. Energy efficient buildings can be achieved using the methods in the IECC already familiar to designers and code enforcement officials. This proposal simplifies the code for those in the enforcement and design communities by relying on the IECC provisions. It will permit code officials to use a system and

terminology that already exists, is familiar, and has a proven track record. The IECC compliance options are also well supported by the energy simulation software industry, including COMCheck and other tools used heavily to demonstrate compliance.

The current IgCC text also contains arbitrary prescriptive requirements in the form of a 10% reduction factor applied to U-factors, C-Factors, F-factors, and SHGCs. There is little to no savings in most climate zones from this requirement and in the some climates, it can result in a poorer-performing building. This public comment will fix this error by referencing the IECC for energy provisions.

Public Comment 2:

Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net) requests Approve as Modified by this Public Comment.

Modify the proposal 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 41/2 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 1/2-inch (12.7 mm) thick.~~
- ~~4.3 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.~~
- ~~5.4 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.~~
- ~~6.5 Chillers shall be equipped with an outdoor air lockout thermostat and chilled water reset control.~~
- ~~7.6 A maximum 5-year phase out plan shall be provided for buildings with existing systems that use CFC-based refrigerants.~~

8.7. 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:

- 8.4.7.1 Allow the owner to set up schedules of operation for the equipment and provide equipment optimal start with adaptive learning;
- 8.2.7.2 Provide trim and respond capabilities based on zone demand;
- 8.3.7.3 Offer the ability to monitor energy usage, including the ability to meter electric, gas, water, steam, hot water, chilled water, and fuel oil services;
- 8.4.7.4 Offer economizing based on enthalpy calculation and/or CO2 set point control;
- 8.5.7.5 Offer load shedding when power companies are at peak demand and need; and
- 8.6.7.6 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. 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.
- 4. Showerhead, toilet, urinal and faucet flow rates shall be in accordance with this code.

Commenter's Reason: We have modified the submitted change by adding the couple of sections that referenced the deleted sections in chapter 6 that we had missed. Other than the added deletions we have not altered any content of our change.

We are witnessing the 2012 IgCC not being adopted. The few jurisdictions that are adopting this IgCC are adopting it with limited scope, as a "voluntary" code or outright deleting Chapter 6 (Dallas, Texas). We stand a chance of losing the IgCC with its valuable environmental contributions, 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 provisions 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 adopt it. If that is the case, then are we really seeing any pay off for all of those efforts?

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This proposal references the IECC in the new section 601.3 with the same language that the IBC does. As such it would also allow the use of ASHRAE 90.1.

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 providing the "above code" provisions. 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.

Public Comment 3:

Hope Medina, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net) requests Approve as Modified by this Public Comment.

Modify the proposal 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:

- 1.1 A time clock is not required by Section C403.2.4.3 of the International Energy Conservation Code.
- 1.2 There is 24-hour occupancy materials with special atmospheric requirements dependent on 24-hour space conditioning.
- 1.3 A majority of the areas of the building served by the system are under setback thermostat control.
- 1.4 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 41/2 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:

- 2.1 Section C403.3.1 of the International Energy Conservation Code would not require an economizer.
- 2.2 The existing system has a water-based economizer.
- 2.3 The existing system does not have an outside air intake.
- 2.4 Special economizer operations such as, but not limited to, carefully controlled humidity would require more energy use than is conserved.
- 2.5 There is insufficient space to install necessary equipment.
- 2.6 Installation of an economizer would require major modifications to the building's life safety system.
- 2.7 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:

- 3.1 Additional insulation shall not be required for piping where any of the following conditions exist:
 - 3.1.1 It is located within HVAC equipment;
 - 3.1.2 It is located within conditioned space that conveys fluids between 60°F (15.6°C) and 105°F (40.6°C);
 - 3.1.3 Piping that is already insulated and the insulation is in good condition; or
- 3.2 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.
- 4.3 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.
- 5.4 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.
- 6.5 Chillers shall be equipped with an outdoor air lockout thermostat and chilled water reset control.
- 7.6 A maximum 5-year phase out plan shall be provided for buildings with existing systems that use CFC-based refrigerants.
- 8.7 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:
 - 8-4 7.1 Allow the owner to set up schedules of operation for the equipment and provide equipment optimal start with adaptive learning;
 - 8-2 7.2 Provide trim and respond capabilities based on zone demand;
 - 8-3 7.3 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 7.4 Offer economizing based on enthalpy calculation and/or CO2 set point control;

- 8-5 7.5 Offer load shedding when power companies are at peak demand and need; and
 8-6 7.6 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. 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.
4. Showerhead, toilet, urinal and faucet flow rates shall be in accordance with this code.

APPENDIX X **SUPPLEMENTARY ENERGY CONSERVATION REQUIREMENTS**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

601.4 X101.1 Minimum requirements. *(No change to current text)*

601.5 X101.2 Multiple buildings on a site and mixed use buildings. *(No change to current text)*

601.5.4 X101.2.1 Multiple buildings on a site. *(No change to current text)*

601.5.2 X101.2.2 Mixed use buildings. *(No change to current text)*

SECTION 602 X102 **MODELED PERFORMANCE PATHWAY REQUIREMENTS**

SECTION 603 X103 **ENERGY METERING, MONITORING AND REPORTING**

SECTION 604 X104 **AUTOMATED DEMAND-RESPONSE (AUTO-DR) INFRASTRUCTURE**

SECTION 605 X105 **BUILDING ENVELOPE SYSTEMS**

SECTION 606 X106 **BUILDING MECHANICAL SYSTEMS**

SECTION 607 X107 **BUILDING SERVICE WATER HEATING SYSTEMS**

SECTION 608 X108 **BUILDING ELECTRICAL POWER AND LIGHTING SYSTEMS**

SECTION 609 X109 **SPECIFIC APPLIANCES AND EQUIPMENT**

SECTION 614 X110 **ENERGY SYSTEMS COMMISSIONING AND COMPLETION**

602.2 X102.2 Annual direct and indirect CO₂e emissions. *(No change to current text)*

602.2.4 X102.2.1 Onsite electricity. *(No change to current text)*

TABLE 602.2.4 X102.2.1 **ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION^a** *(Portions of table not shown remain unchanged)*

602.2.2 X102.2.2 Onsite nonrenewable energy. *(No change to current text)*

TABLE 602.2.2 X102.2.2 **FOSSIL FUEL EMISSION FACTORS** *(Portions of table not shown remain unchanged)*

603.3.7.5 X103.3.7.5 Other renewable energy electric production systems. *(No change to current text)*

Commenter's Reason: The first portion of the public comment addresses the 2 Sections in chapter 10 that referenced a section in the energy chapter submitted to be removed.

We wanted to present a solution to those who were in opposition to removing the overly cumbersome energy chapter. We chose to take the sections we had originally proposed to have deleted, and removed them from the body of the energy chapter and place them to an appendix chapter. That gives those jurisdictions that would like to require their energy provisions to go beyond what is required in the 2015 IECC and what is in the body of the 2015 IgCC the option of adopting the appendix chapter. This should address the concerns from both sides. End users are able to have a code where the requirements of the other chapters that are not found in the base codes to produce green projects. Industry gets increased energy requirements as an option.

There are many apprehensions when it comes to writing an energy chapter that is suppose to be above the current IECC. The proposed code changes are due only a couple of months after the IECC final actions hearings have finished. We are trying to write changes for an above code before anyone is able to see what the base code looks like. We are writing up theoretical ideas to put in place as codes, and requiring them before we are able to figure out if they are usable or enforceable. It's the end users who are stuck with figuring it out.

GEW1-14

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

Proposed Change as Submitted

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 CO ₂ e 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.~~ *International Energy Conservation Code*.

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 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: 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

Public Hearing Results

Errata

The following is errata that was posted to the ICC webpage.

1003.2.2 Heating, ventilating and air-conditioning.

3. HVAC piping and ducts, including those located above suspended ceilings, shall comply with Sections 606.3 and 606.4. *International Energy Conservation Code.*

The following is errata that was not posted to the ICC webpage.

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.

(Portions of the proposal not shown remain unmodified.)

(Errata already incorporated into cdpACCESS.)

Committee Action:

Disapproved

Committee Reason: Consistent with the actions on GEW1-14 and GEW4-14, the committee disapproved this proposal. The green code needs to have an energy efficiency chapter. This proposal would force all buildings to be subsection to performance modelling which is very expensive; especially for smaller buildings. It is unclear if this is 15 plus 10 percent savings because of the incomplete reference to IECC Section 407. There is merit to a concept of IECC PLUS. The IgCC is an incubator for new ideas, removing the chapter loses that option.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mark Nowak, representing Steel Framing Alliance requests Approve as Modified by this Public Comment.

Modify as follows:

601.3 Application. Buildings and their associated building sites shall comply with Section C407 of the *International Energy Conservation Code*, and The building energy cost shall exceed the requirements of Section C407 by not be less than 10 percent, or equal to 85 percent of the standard reference design building.

Appendix E **Energy Efficiency Reduction**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

E101.1 Scope. The provisions in this chapter are designed to achieve energy conservation levels beyond those in the *International Energy Conservation Code*.

E201 Energy efficiency reduction. The building energy cost shall be reduced by 10 percent or greater than the requirements in Section 601.3 of this code.

Commenter's Reason: This public comment simplifies the code by relying on the base IECC code. It will eliminate the need for code officials, designers, owners, and others to learn and implement a performance 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. This is a simplification of the IgCC 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 that call for a 10% decrease in the IECC U-Factors, F-factors, C-Factors and SHGCs. There has never been substantiation provided to support this arbitrary 10% decrease in these values. In warmer climate zones, there will be little to no energy savings from the U-Factor modifications. In colder climates, the SHGC requirements will result in a lower-performing building compared to the IECC. This public comment addresses these errors and provides a compliance path that is familiar to designers and code enforcement officials, has a proven track record, and eliminates the need to show compliance with multiple methods by relying on the IECC provisions.

This public comment further clarifies that the use of the IECC provisions must include the current increase (85% multiplier) in efficiency required when using the IECC performance option. It also recognizes that further increases in efficiency need to consider climate-specific locations in order to not create unintended consequences and to actually deliver energy efficiency increases. Thus, an appendix has been added that communities can adopt to further improve on efficiency. By placing this in an appendix, communities can evaluate the appropriateness of this increase according to their specific climate and other local conditions.

GEW2-14

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

Proposed Change as Submitted

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 601.3.1 or Section 601.3.2: 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 CO ₂ e 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 189.1 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/ REFERENCE D STANDARD
				Preoccupancy	Post-occupancy	
Chapter						
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
b. Calibration	X	X	Testing and review and evaluation or test reports	During commissioning	Annually	603, 610.5 Section 10.3 of
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

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST- OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCE D 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
c. Mechanical system manuals – construction documents to require O&M	X	None	Verification of construction documents	Plan review	None	611.1.5.2 Section 10.3 of ASHRAE
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	611.1.4 Section 10.3 of ASHRAE
b. Documentation of required commissioning outcomes	X	None	Verification with the building owner	Subsequent to completion of all commissioning	None	611.1.4 Section 10.3 of ASHRAE
c. Preparation and availability of a commissioning plan	X	None	Verification with the RDP or commissioning agent	Between plan review and commissioning initiation	None	611.1.4 Section 10.3 of ASHRAE
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	TB D	611.1.2 Section 10.3 of ASHRAE
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	TB D	611.1.3 Section 10.3 of ASHRAE
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	TB D	611.1.3.2 Section 10.3 of ASHRAE
g. Preparation of preliminary commissioning report	None	X	HVAC system installer/contract or or commissioning agent	None	Subsequent to commissioning	611.1.4 Section 10.3 of ASHRAE
h. Acceptance of HVAC systems and equipment/system verification	None	X	Building owner	None	Letter verifying receipt of the commissioning report	611.1.4.4 Section 10.3 of ASHRAE

CONSTRUCTION OR SYSTEM REQUIRING VERIFICATION	PREOCCUPANCY	POST- OCCUPANCY	METHOD	OCCURRENCE		SECTION/ REFERENCE D 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	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:						
Auto demand reduction control system functionality	X	X	Functional testing	Final inspection	18-24 months	604.4 Section 10.3 of ASHRAE
Plug load controls	X	None	Functional testing	Final inspection	None	608.6 Section 10.3 of ASHRAE
Connection of appliances to switched receptacles	—	X	Field inspection	None	18-24 months	608.6 Section 10.3 of ASHRAE
Specified transformer nameplate efficiency rating	X	None	Field inspection	Final inspection	None	608.8.1.1 Section 10.3 of ASHRAE
Verification of lamp	X	X	Field inspection	Final inspection	18-24 months	608.10 Section 10.3 of ASHRAE
Verification of ballast	X	None	Field inspection	Final inspection	None	608.10 Section 10.3 of ASHRAE
Lighting						
a. Installation	X	None	Field inspection	Post-installation	None	608.1.1 Section 10.3 of ASHRAE
b. Calibration	X	X	System installer/contractor or commissioning agent	Post-installation	18-24 months	611.3.3 Section 10.3 of ASHRAE

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 40 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 45 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 601.3.4~~ Section 7 of ASHRAE 189.1 shall be in accordance with the portions of Table A106 that reference ~~Section A106.1, Equation 6-1 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 601.3.4~~ 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

Public Hearing Results

The following is errata that was posted to the ICC webpage.

302.1 Requirements determined by the jurisdiction.

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.

302.1.1 zEPI 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 189.1 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.

(Portions of the proposal not shown remain unmodified.)

(Errata already incorporated into cdpACCESS.)

Committee Action:

Disapprove

Committee Reason: ASHRAE189.1 was not made available to the committee to allow evaluation as an alternative compliance method for energy conservation requirements. There is already an option to follow 189.1 as an option for the code, there is no reason to allow selective use in this situation.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

**Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests
Approve as Submitted.**

Commenter's Reason: ASHRAE 189.1-2011 is published with the the current version of the IGCC, and is available for comparison. The 2014 version will be available by late September 2014 or early October 2014. By aligning the provisions as proposed, it will make both codes easier to enforce.

Public Comment 2:

**Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests
Approve as Modified by this Public Comment.**

Modify the proposal 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	Energy cost reduction project electives	<input type="checkbox"/> Yes <input type="checkbox"/> No
A106.1	Project Energy cost is at least 3 <u>2</u> percent lower than required by Table 302.1	<input type="checkbox"/> 1 elective
A106.1	Project Energy cost is at least 6 <u>5</u> percent lower than required by Table 302.1	<input type="checkbox"/> 2 electives
A106.1	Project Energy cost is at least 9 <u>8</u> percent lower than required by Table 302.1	<input type="checkbox"/> 3 electives
A106.1	Project Energy cost is at least 12 <u>10</u> percent lower than required by Table 302.1	<input type="checkbox"/> 4 electives
A106.1	Project Energy cost is at least 15 <u>13</u> percent lower than required by Table 302.1	<input type="checkbox"/> 5 electives
A106.1	Project Energy cost is at least 18 <u>16</u> percent lower than required by Table 302.1	<input type="checkbox"/> 6 electives
A106.1	Project Energy cost is at least 21 <u>19</u> percent lower than required by Table 302.1	<input type="checkbox"/> 7 electives
A106.1	Project Energy cost is at least 24 <u>22</u> percent lower than required by Table 302.1	<input type="checkbox"/> 8 electives
A106.1	Project Energy cost is at least 27 <u>25</u> percent lower than required by Table 302.1	<input type="checkbox"/> 9 electives
A106.1	Project Energy cost is at least 30 <u>28</u> 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

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
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

Commenter's Reason: This proposal would align the energy provisions of the IGCC with the energy provisions of ASHRAE Std. 189.1 while still preserving the jurisdictional elective flexibility of the IGCC.

This public comment takes the original proposal and modifies Table A106 to make it modestly easier to obtain points.

GEW3-14

GEW5-14

601.3, 605.1, 606.1, 607.1, 608.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: While the committee felt that eliminating the multiple references was a good idea, they found the new language in Section 601.3 to be unclear. The phrase 'corresponding requirement' did not provide adequate guidance to the code user.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Jim Edelson, representing New buildings Institute requests Approve as Modified by this Public Comment.

Modify the proposal 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 The provisions of this chapter, it supersedes shall take precedence over the corresponding requirement provisions 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.

Commenter's Reason: How do the measures and provisions of the IgCC relate to the IECC. This frequently asked question is not directly addressed in the current text of the IgCC. Section 101.2 states that the IgCC is an "overlay code", but does not define "overlay". Section 102.4.1 describes what happens when there is a conflict with a code that is not in the list of referenced I-codes, but does not describe what happens when there is a conflict with the referenced I-codes, including the IECC.

This modified comment uses language similar to Section 102.4.1 to specify the relationship of the IgCC to corresponding provisions in the IECC. The Memphis Committee appreciated the attempt to clarify the "overlay" relationship in the original proposal but asked the proponents to improve the language. This modification does that by using one simple declarative sentence to replace a complex if/then sentence structure.

In addition, the proposal makes editorial improvements that are not modified by this Comment. The proposal deletes duplicate language in each of the 60X.1 sections. The proposal also makes the title of 608.1 consistent with the titles of 605.1, 606.1, and 607.1.

Public Comment 2:

Garrett Stone, representing Energy Efficient Codes Coalition (gas@bbrslaw.com); Harry Misuriello, representing American Council for an Energy Efficient Economy (misuriello@verizon.net); Maureen Guttman, representing Building Codes Assistance Project request Approve as Modified by this Public Comment.

Modify the proposal 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 for the same building system or component is provided specified in this chapter and in the International Energy Conservation Code, ~~it the requirement in this chapter~~ 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.

Commenter's Reason: We recommend that this proposal be Approved As Modified in accordance with this public comment. This modification tightens the language of GEW5 and accomplishes the original intent of the proposal. In order for the IgCC to be a true "overlay" code to the IECC, the code should be clear about the applicability of the IECC. Whenever there are requirements in the IgCC that apply to specific systems or components, these requirements essentially replace the IECC requirements.

GEW5-14

GEW9-14

601.3

Proposed Change as Submitted

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

Public Hearing Results

The following is errata that was posted to the ICC webpage.

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*

Committee Action:

Disapproved

Committee Reason: The committee understood the concept of the proposal, which is to require additional energy enhancement provisions from Section C406 of the IECC, but found the language unclear. For example, the IECC requires one of the six enhancements to be used. This provision requires two. Does that mean a total of 3 (1 plus 2) or a total of 2 (1 plus 1)? The structure of the sentence also made it unclear if two enhancements were required for either Section 601.3.1 or Section 601.3.2 compliance - or if it was required for both. The committee hopes the proponent will return with a public comment to clarify the intent.

Assembly Action:

None

Analysis:: The published proposal contained two errata in the form of extra commas. One located after Section 601.3.2 in the first sentence and one located after Section 406.1.1 in the second sentence.

Individual Consideration Agenda

Public Comment:

Jim Edelson, representing new buildings institute requests Approve as Modified by this Public Comment.

Modify the proposal 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.

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, 611 and 614 not less than one additional option from Section C406.1 of the *International Energy Conservation Code*. Existing buildings are not required to comply with Section C406 of the *International Energy Conservation Code*.

Commenter's Reason: The modeled performance compliance path in the IgCC requires a 10% performance improvement over the IECC. To maintain consistency among the energy compliance paths in the IgCC, the prescriptive path should also target 10% energy saving beyond the 2015 IECC. No analysis has identified energy savings in IgCC's prescriptive path where the energy savings taken in total exceed even 5% savings beyond 2015 IECC.

This proposal as modified by the comment takes advantage of the increased number of optional packages in Section C406 of the 2015 IECC. In the 2015 IECC, most buildings must comply with one of six packages from section 406 of the IECC. The energy savings of the IgCC prescriptive path can be enhanced with this new code language by requiring one additional option to be selected in order to garner more energy savings.

The Memphis Committee noted there were confusing elements in the grammatical construction of the original proposal. This was compounded by the fact that an errata was published because two additional commas were present in the monograph that were not in the proposal as submitted. The modification simplifies, shortens and clarifies the language of the original proposal and also places it in Section 601.3.2, which addresses only the prescriptive path. The modification also clarifies that existing buildings are not required to provide any of the packages from Section C406, which is consistent with the charging language in the IECC.

GEW9-14

GEW14-14

601.6 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that the limitation that would be imposed by the proposed text limit design flexibility and choice. While there was some support of the concept of the proposal in order to limit 'gaming' of the system, the committee felt the proposal was too simplistic. How someone would do an area weighted average was unclear.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Garrett Stone, representing Energy Efficient Codes Coalition (gas@bbrslaw.com); Harry Misuriello, representing American Council for an Energy Efficient Economy (misuriello@verizon.net); Maureen Guttman, representing Building Codes Assistance Project request Approve as Submitted.

Commenter's Reason: We recommend that this proposal be Approved As Submitted because it would establish a meaningful backstop that will help ensure that buildings certified "green" will have reasonably efficient thermal envelope requirements. The Committee's concerns over how to calculate an area-weighted average are misplaced - area-weighted averages have long been a part of the IECC, and several IgCC sections require area-weighted averaging as well. The intent of this proposal is to clarify that because the thermal envelope will likely be unchanged over very long periods of time, trade-offs of these components against shorter-lived components must have some limitations. Allowing area-weighted averaging, as well as a roughly 20% gap between the requirements and the backstop, provide flexibility along with reasonable protection against all of the problems caused by inefficient envelopes.

Public Comment 2:

Name: Jay Crandell, Applied Building Technology Group LLC, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

601.6 Building thermal envelope trade-off allowance. Where compliance with this code permits use of U-factors, C-factors, F-factors, or SHGC values greater than those required by Section 605.1.1, the values permitted shall not exceed by more than 10 percent those required in Tables C402.1.4 and C402.4 of the *International Energy Conservation Code*.

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 value in Tables C402.1.4 and C402.4 of the specified tables *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 building roof area.

Exception: Increased U-factor, C-factor, F-factor, and SHGC values shall be permitted in accordance with Section 601.6.

Commenter's Reason: FSC supports the originally submitted GEW14 proposal and also offers this public comment as an alternative to achieve similar purpose. This public comment is coordinated with Section 605.1.1 by adding an exception to make it clear that trade-offs are available as an option to allow relaxation of the prescriptive envelope requirements in the IgCC. It also simplifies and clarifies the prescriptive insulation and fenestration language in Section 605.1.1. In addition, it addresses the committee's confusion with regard to area averaging as referenced in the original proposal. Finally, it makes corrections to coordinate with new table numbers in the 2015 IECC.

The original GEW-14 proposal and this public comment provide the flexibility of a trade-off allowance to reduce envelope requirements by as much as 20% below the IgCC requirements in Section 605.1.1. Thus, envelope requirements in the IgCC can be reduced to a level that is 10% less stringent than the IECC. This "overlay" approach uses the IECC provisions as a foundation for requirements in the IgCC and allows trade-offs to be used such that the familiar prescriptive insulation and fenestration requirements in the IECC can be used (or even further reduced). Consequently, this approach preserves flexibility while also ensuring long-lasting energy efficiency for buildings in a way that aligns with the sustainability intent of the IgCC.

The ICC membership is encouraged to carefully consider the following reasons for voting in support of GEW-14 as submitted or as modified by this public comment:

1. The building envelope performs 24-7-365 for the entire life of the building and is the most durable and reliable aspect of energy conservation. NAHB's report, "Study of Life Expectancy of Home Components", life-cycle of building materials survey indicates that the life-expectancy of insulation is for "lifetime" of the building which is potentially more than 100 years. Other reports by DOE and NIBS confirm this "lifetime" estimate.
2. It is costly to later improve the insulation components concealed with the building structure; therefore, the best time to provide cost-effective envelope performance is when the building is being originally constructed. The best time is now, not tomorrow ...or 20 years from now. There is no shortage of materials and methods to provide competitive, safe, durable, and cost-effective solutions for building envelopes; thus, there is no practical need to continue to allow an unlimited trade-off of durable building envelope performance.
3. As IgCC is a "green code", durability and energy efficiency are key aspects of sustainability and the intent of the IgCC. Allowing the most durable aspects of building energy conservation to potentially be traded off by unlimited and potentially

significant amounts should be avoided or at least moderated. This proposal provides a reasonable and moderate allowance.

4. The trade-off allowance concept is not new and it has been included in other codes and standards, such as ASHRAE 189.1 Appendix D (Section D1.3), IECC Section R402.5 (limits on fenestration U-factor and SHGC), California Title 24, Subchapter 7 (limits on maximum U-factor for roofs and walls), and, more recently, Georgia amendments to 2009 IECC (minimum R-values and U-factors for use with trade-offs), and Section R406.2 of the IECC (thermal envelop not less than the 2009 IECC in use of the ERI compliance alternative). Thus, a trade-off limit has been shown to be workable and, for sustainable construction, ensures that the most durable aspect of energy efficiency is not too deeply traded away.
5. Allowing trade-offs at a sensible level is also a principle closely associated with integrated design of overall building systems. Integrated design considers not only the interactions and interdependencies between building systems, but it also considers the vulnerability of over- or under-emphasizing the importance of various parts or sub-systems of the overall building. This proposal provides a back-stop against under-emphasizing the building envelope while still allowing significant flexibility to trade it off for more emphasis of other systems in achieving cost-effective code compliance.
6. Meaningful resiliency of buildings in the face of disaster, power-outages, and extreme winter or summer conditions is also a key component of sustainable construction when approached effectively in a practical and cost-effective way. When a power outage occurs, only the building envelope remains functional in controlling the building indoor environment. Thus, it is important to a resilient response to power outages that may occur at any time and often at very inconvenient times, e.g., winter ice storms, summer thunderstorms and hurricanes, etc. When extreme winters or summers occur (such as the winter of 2013-2014), energy demand peaks, supplies are depleted, and energy prices rise (see charts below). The energy code provisions are based on "average" or "typical" years not extremes that might occur every 5, 10, or more years. With building envelope thermal performance traded-off to unlimited extents currently permitted in the code, the resiliency aspect of sustainability is harmed. The IgCC can help remedy this concern with the approval and inclusion of GEW-14 as submitted or as modified by this public comment.

Chart 1: Depletion of Natural Gas Reserves (Winter 2013-2014)

Chart 2: Resulting Spike in Natural Gas Prices (Prices Doubled)

GEW14-14

GEW22-14

602.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal would set the same CO₂e level for all buildings. As the code allows setting a lower zEPI level, they shouldn't be locked into the CO₂e level. If the intent was to eliminate zEPI, the line defining zEPI should have also been struck out.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Neil Leslie, representing self (neil.leslie@gastechnology.org) requests Approve as modified by this public comment.

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.

$$\text{CO}_2\text{e pd} \leq (\text{CO}_2\text{e srbd}) \times 51/57 \quad \text{(Equation 6-2)}$$

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.

Commenter's Reason: The committee's reason statement is not consistent with the intent of the proposed change. The referenced zEPI equation provides a fixed compliance requirement for a building, as it should, for energy performance. However, the current CO₂e compliance requirement for a building floats depending on the proposed building zEPI. That creates an additional and unnecessary hurdle for the compliant building, and is more stringent for more efficient buildings than it is for less efficient buildings, which is not fair. The proposed change fixes this inequity. The comment proposes an amendment to the original proposal to remove the zEPI equals statement because the intent is to remove zEPI from this equation – and it no longer needs to be explained. Not removing the line in the original submittal was an oversight..

GEW22-14

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

Proposed Change as Submitted

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^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
ERGT	ERGOT All	2.93
FRCC	FRCC All	2.97
HIMS	HICC Miscellaneous	3.82
HIOA	HICC Oahu	3.14
MORE	MRO East	3.40

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
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
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.~~

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_seattle_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_GHG_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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that moving from 'source' energy to 'site' energy was a step backwards in the conservation of energy through construction requirements. The committee sees saving energy as a 'societal' good and this proposal doesn't move the discussion forward. Finally, without a reference to Appendix G or a substitution, the code would be without a model by which to judge comparative energy usage.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

602.1.2 Base annual energy use index. The proposed energy use index (EUIp) of the building and building site shall be calculated in accordance with Equation 6-1 and Appendix G of ASHRAE 90.1. 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.~~

Commenter's Reason: By aligning the IGCC with ASHRAE 90.1 and 189.1, which use energy costs based on site energy usage, this modification will improve the IGCC. This proposal will ensure that buildings that use the performance path will actually save energy and energy costs, which will be a significant step forward.

GEW23-14

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

Proposed Change as Submitted

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 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.

$$zEPI = 57 \times \frac{\text{Proposed building performance/Baseline building performance}}{(EUI_p/EUI)} \quad \text{(Equation 6-1)}$$

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.~~

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 602.1.2.4 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 G4.2 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.

$$\text{CO}_2\text{e pdp} \geq (\text{zEPI} \times \text{CO}_2\text{e srbbbp})/57 \quad (\text{Equation 6-2})$$

where:

zEPI = the minimum score in accordance with Section 602.1.4 602.2.

CO₂e pdp = emissions associated with the proposed design building performance.

CO₂e srbbbp = 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*.

602.2.1 602.3.1 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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal is a broad attempt to clean up text and titles of the sections. The proposal maintains zEPI. It makes the section more easy to understand and apply. The intent in approving this change does not mean that the other substantive changes approved by the committee are overridden. While other proposals on the agenda also addressed improvements to this section, this proposal was seen as the best of the options.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mark Heizer, representing self, requests Disapprove.

Commenter's Reason: GEW-24 , while a good attempt at fixing the current zEPI method, is incomplete and does not provide a viable performance calculation method for buildings outside of the basic building categories noted in this proposal. In addition, the entire modeling methodology is tied to ASHRAE 90.1 for compliance.

Without an alternate compliance path that may be used by other building types, GEW-24 should be disapproved. GG-76 with Public Comment provides an alternate path for performance based modeling compliance; GG-76 allows for performance modeling based on relative compliance to the IECC. By providing an alternate path of equal or better efficiency for designers that remains within the I-codes, equitable choices are available for compliance. All building types can use GG-76 with Public Comment

If GG-76 with public comment is allowed to move forward, then both GG-76 and GEW-24 would be recommended for approval. Without GG-76, GEW-24 leaves the IgCC with a limited, unfair compliance method based solely on ASHRAE 90.1. And IgCC energy compliance could be required excluding any use of the IECC: As an overlay code, the IECC should be the starting point for IgCC energy compliance and be an allowed methodology to show compliance. Without GG-76 , GEW-24 should not move forward without an I-code path.

GEW24-14

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

Proposed Change as Submitted

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 CO ₂ e 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: _____ yEPI <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~~ annual energy use cost index 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~~ use 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 CONVERSIO N FACTOR
AKGD	ASCC Alaska Grid	2.97
AKMS	ASCC Miscellaneous	4.76
ERCT	ERCOT All	2.93
FRCC	FRCC All	2.97

eGRID-2007 SUB-REGION ACRONYM	eGRID-2007 SUB- REGION NAME	ENERGY CONVERSION FACTOR
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	2.54
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	2.64
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 10 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 15 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 A106.1₇, 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:

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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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal takes the code into a different direction from the previous actions to maintain the use of zEPI. The concern expressed that ASHRAE 90.1 looking future Analysis: factors can be addressed during the updates for future editions of the IgCC. This is a radical change that would need refinement before it comes into the code. Similar to other proposals, the committee found changing from source energy to site energy unacceptable

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Craig Drumheller, representing National Association of Home Builders (CDrumheller@nahb.org) request Approve as Submitted.

Commenter's Reason: This simple change will clarify what the actual requirements are of referenced codes in the IgCC. There are a number of jurisdictions which do NOT adopt the entire family of I-codes or they may have amended a referenced code. For example many western states adopt IAPMO as the plumbing code- so to comply with the IgCC is it necessary to adopt the IPC? Must a building comply with the unamended version of a referenced code, or the code as adopted locally. This language provides a simple solution that adds code adoption flexibility for jurisdictions and clearly states the intension of the IgCC and should be approved As Submitted.

Public Comment 2:

Charles Foster, representing self (cfoster20187@yahoo.com) requests Approve as Submitted.

Commenter's Reason: I agree that this proposal would lead the IGCC in another direction from its present course but respectfully submit that would be a good thing. The IGCC decided it would try a compliance metric not used in any other code or standard, namely Zepi. The IGCC has not gained widespread acceptance and one of the reasons I believe it is viewed as perhaps too difficult for code officials to enforce and too hard for builders to use. This proposal would change the compliance metric to cost -- something everybody understands and that is used in other similar documents like ASHRAE Std 189.1.

Finally, the Committee reasoning suggests that somehow this proposal would change the compliance metric from source to site. They were mistaken. It would change the metric from source to energy cost. Site energy is not mentioned in this proposal.

Public Comment 3:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

602.1.1 yECI. Performance-based designs shall demonstrate an annual energy cost index yECI of not more than 0.8 as determined in accordance with ~~Equation~~ Equations 6-1 6-1a and 6-1b for energy cost reduction and shall demonstrate a CO₂e emissions reduction in accordance with Section 602.2 and Equation 6-2 for CO₂e.

$$yECI = (EUCIp/EUCI) \quad \text{(Equation 6-1 6-1a)}$$

and

$$yECI \leq 0.8 \quad \text{(Equation 6-1b)}$$

where:

EUCIp = the proposed annual energy cost for the proposed design of the building and its site calculated in accordance with Section 602.1.2.

EUCI = the base annual energy cost for a baseline building and its site calculated in accordance with Section 602.1.2.

602.1.2 Annual energy cost index. The proposed and base annual energy cost index (~~ECIp~~ EUCIp and ~~ECI~~ EUCI) 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. The annual energy use shall include all energy used for building functions and its anticipated occupancy

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.

$$CO_2e_{pd} \leq (yECI \times CO_2e_{srbd}) \quad \text{(Equation 6-2)}$$

where:

yECI = the calculated annual energy cost ratio in accordance with Section 602.1.1.

CO₂e_{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.

Commenter's Reason: The proposed modifications clarify the proposal. This proposal will align the performance path of the IGCC with the performance path of ASHRAE 189.1, which is based on measurable and verifiable energy costs.

GEW26-14

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

Proposed Change as Submitted

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 CO ₂ e EMISSION REDUCTION			
302.1, 302.1.1, 602.1	zEPI <u>or</u> yECI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 <u>or</u> a yECI of .75 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</u> yECI , 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.

$$zEPI = 57 \times (EUI_p/EUI) \quad \text{(Equation 6-1)}$$

$$yEPI = C_{lp} / CI \quad \text{(Equation 6- XXX)}$$

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.

C_{lp} = 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 (EC_{lp} 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 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee found that adding a second methodology alongside of zEPI would be confusing to the code users. The committee noted that there were inconsistencies between the methodologies that would hamper understanding.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Keith Dennis, representing NRECA (keith.dennis@nreca.coop) requests Approve as Submitted.

Commenter's Reason: The proposal is clear as written, is easy to understand and gives users an increase desired level of flexibility

Public Comment 2:

Charles Foster, representing self (cfoster20187@yahoo.com) requests Approve as Submitted.

Commenter's Reason: This proposal would modify the current code to allow the use of cost as an alternative means of compliance -- currently the IGCC uses Zepi.

The Committee stated that it felt using cost as a compliance metric would be confusing to users and code officials.

The IECC, ASHRAE Std. 90.1, ASHRAE Std. 189, and most other energy codes and standards use cost as the basis for compliance.

The current compliance metric, Zepi, is confusing. Cost is not.

Please reverse the Committee's decision.

Public Comment 3:

Steven Rosenstock, representing Edison Electric Institute Institute (srosenstock@eei.org) requests Approve as Submitted.

Commenter's Reason: This approach will provide much more flexibility to building owners and designers, and it will provide an approach that is more consistent with the approach taken in ASHRAE 189.1.

GEW27-14

GEW28-14

602.1.2.1, Table 602.1.2.1, 602.1.2.2, Table 602.1.2.2, 602.1.2.3

Proposed Change as Submitted

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.

602.1.2.2 Site to source electric power conversion. In calculating the annual energy use index, electric energy used at the site 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 ^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.

602.1.2.3 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 be 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

Public Hearing Results

The following is errata that was not posted on the ICC website.

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.

602.1.2.2 Site to source electric power conversion.

In calculating the annual energy use index, electric energy used at the site 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 ^a	1.09
Fuel Oil ^a	1.13
LPG ^a	1.12
Purchased District Heating – Hot water	1.35
Purchased District Heating – Steam	1.45
District Cooling	0.33 x value in Table 602.1.2.1
Other	1.1

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.

Committee Action:

Disapproved

Committee Reason: The committee disapproved this change at the request of the proponent. The actions proposed by GEW28-14 were taken care of through the approval of previous actions (GEW24-14).

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

David Collins, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com) requests Approve as Submitted.

Commenter's Reason: The AIA supports the approval of GEW28 as originally submitted. The three sections in the IgCC concerning a base annual energy use index in Section 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 Standard 90.1, but in reality they are simply attempting to change the methods of evaluating various energy sources so that that may be done with consistency.

The modification to Section 602.1.2.1 will match the content of the section with the table modified to include all the specific fuels addressed. Energy use must be converted to consistent units by multiplying the nonrenewable energy fossil fuel use at the utility meter or measured point of delivery in Btus and multiplying that by the conversion factor in Table 602.1.2.2.

Finally, GEW28 modifies Section 602.1.2.3 by deleting the provision already addressed in this proposal in the changes to Section 602.1.2.1 requiring energy to be measured consistently and independent of the fuel type.

These changes make the code much more understandable and provides appropriate means for evaluation of the energy use in a building. We urge the membership to vote for approval as submitted on GEW29.

GEW28-14

GEW29-14

602.1.2.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee disapproved the proposal following the testimony of the proponent that the changes included in GEW29-14 have been taken care of by previous actions (GEW24-14).

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

David Collins, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com) requests Approve as Submitted.

Commenter's Reason: The AIA supports GEW29 as originally submitted. The performance modeling required by the IgCC to determine an appropriate zEPI value contains an exception in the energy modeling protocol of ASHRAE Standard 90.1 Appendix G prohibiting the inclusion of on-site or site recovered renewable energy sources. By eliminating this exception, the energy modeling protocol of Standard 90.1 is modified for use in the IgCC to meet the original intent of the Sustainable Building Technology Committee in developing the IgCC 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.

GEW29 modifies this language so that energy use shall be converted by multiplying the nonrenewable energy fossil use at the utility meter or measured point of delivery in Btus and multiplying by the conversion factor in Table 602.1.2.2.

We urge the membership to maintain an equitable means for determining added energy conservation.

GEW29-14

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

Proposed Change as Submitted

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 2010 SUB-REGION ACRONYM	eGRID 2007 2010 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	3.44 <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	3.45 <u>3.28</u>
RFCM	RFC Michigan	3.05 <u>3.35</u>
RFCW	RFC West	3.44 <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>3.20</u>
SRTV	SERC Tennessee Valley	3.44 <u>3.30</u>
SRVC	SERC Virginia/Carolina	3.43 <u>3.24</u>

eGRID 2007 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	ENERGY CONVERSION FACTOR
SPNO	SPP North	3.53 <u>3.57</u>
SPSO	SPP South	3.05 <u>3.26</u>
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	4.43 <u>1.19</u>
LPG	4.42 <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 ~~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 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh) (kg/kWh)
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>

eGRID 2007 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh) (kg/kWh)
NYLI	NPCC Long Island	1651 <u>0.698</u>
NEWE	NPCC New England	999 <u>0.428</u>
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	1601 <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	1394 <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

Public Hearing Results

The following is errata that was posted on the ICC website:

Table 602.1.2.1
Electricity Generation Energy Conversion Factors by EPA eGrid Sub-region^a

eGRID 2007-2010 Subregion Acronym	eGrid 2007-2010 Sub-region Name	Energy Conversion Factor
SRSO	SERC South	3.083.20
SRTV	SERC Tennessee Valley	3.11 3.30

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.

Table 602.1.2.2
U.S Average Building Fuels Energy Conversion Factors by Fuel Type^a

Table 602.2.1
Electricity Emission Rate by EPA eGrid Sub-region^a

eGRID 2007-2010 Subregion Acronym	eGrid 2007-2010 Sub-region Name	2005 CO ₂ e Rate (lbs/MWh) (kg/kWh)
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(Portions of proposal not shown remain unchanged.)

(Errata already incorporated into cdpACCESS.)

Committee Action:

Approved as Submitted

Committee Reason: GEW31 relies on the same technology as currently applied in the code, that being the EPA eGRID Subregions. It updates the values from 2007 to 2010.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Charles Foster, representing self (cfoster20187@yahoo.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 2010 SUB-REGION ACRONYM	eGRID 2010 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	3.15 <u>2.95</u>
AKMS	ASCC Miscellaneous	1.90 <u>0.90</u>
ERCT	ERCOT All	3.08 <u>2.28</u>
FRCC	FRCC All	3.26 <u>2.43</u>
HIMS	HICC Miscellaneous	3.67 <u>2.63</u>
HIOA	HICC Oahu	3.14 <u>2.98</u>
MORE	MRO East	3.50 <u>2.50</u>
MROW	MRO West	3.64 <u>2.36</u>
NYLI	NPCC Long Island	3.47 <u>3.23</u>
NEWE	NPCC New England	3.03 <u>1.71</u>
NYCW	NPCC NYC/Westchester	3.21 <u>1.58</u>
NYUP	NPCC Upstate NY	2.66 <u>1.08</u>
RFCE	RFC East	3.28 <u>1.75</u>
RFCM	RFC Michigan	3.35 <u>2.62</u>
RFCW	RFC West	3.29 <u>2.31</u>
SRMW	SERC Midwest	3.40 <u>2.73</u>
SRMV	SERC Mississippi Valley	3.20 <u>2.13</u>
SRSO	SERC South	3.20 <u>2.34</u>
SRTV	SERC Tennessee Valley	3.30 <u>2.21</u>
SRVC	SERC Virginia/Carolina	3.24 <u>1.80</u>
SPNO	SPP North	3.57 <u>2.80</u>
SPSO	SPP South	3.26 <u>2.84</u>
CAMX	WECC California	2.89 <u>1.52</u>
NWPP	WECC Northwest	2.32 <u>1.44</u>
RMPA	WECC Rockies	3.82 <u>3.05</u>
AZNM	WECC Southwest	3.10 <u>2.14</u>
None	Not Included	3.15

Commenter's Reason: GEW31 states that it is based on eGRID 2007 which, in turn, uses 2005 data. The electric industry has changed dramatically over the last 9 years with the proliferation of renewable generation like wind and solar and, separately, the substitution of gas fired generation for coal.

This proposal updates the table to use eGrid 2014 which is based on 2010 data found at <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>.

Explanation of source of data:

1. Click on hyperlink above
2. Select "2010 data files (xls)"
3. when spreadsheet opens, select SRL10 tab
4. divide column F (annual heat input in MMBtu's) by column H (net generation in MWH's)
5. multiply answer to 4 above by 3.413 to convert to BTU's

The IGCC should use the most current data available which is the purpose of this proposal.

This public comment also removes the row entitled "None." This entire row is new - it was not in the 2012 IGCC and there is simply no support for it. For instance, Canada is mostly hydro and would have a source number much lower than 3.15.

Public Comment 2:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Disapprove.

Commenter's Reason: There are many technical and numerical problems with this proposal.

- 1) Inconsistent units. While the estimated values for electricity would be shown in kilograms (kg), the values for fossil fuels are shown in pounds (lbs). For an IP publication, all values should be in pounds for consistent reference. For an SI publication, all units should be in kg.
- 2) Opaque revisions for fossil fuels. While the electric estimated values may be based on EPA e-GRID publications (which are publicly available), the changes made to fossil fuels and district energy are based on non-public documents. For example, ASHRAE Standard 105 does not publish values in the body of the standard (they are blank tables). It is not clear why the values for natural gas and propane increase, but the value for fuel oil decreases. Also, it seems inconsistent that the value for natural gas goes up by 2.66%, and the value for fuel oil goes down by 1.31%, but the value for propane (which is a by-product of natural gas and propane) increases by 5.62%.
- 3) Possibly different years. The estimated values for electricity are based on 2010 data, but it is not clear as to what year the values for fossil fuels and district energy are based on. Is it 2013, 2012, 2011, 2010, 2005, 2000? No information is provided.
- 4) Incorrect estimates for electricity. The committee rejected the use of "marginal" or "non-baseload" estimates in other proposals, since energy can be saved at any time of day or season. However, the values shown in this table are not the total values shown in the eGRID 9th edition Version 1.0 Year 2010 Summary Tables. Below are some examples:

Value in Proposal (kg/kWh)	equivalent IP units (lb/MWh)	Value in eGRID	difference
AKGD - 0.685	1510	1259.64	+19.9%
CAMX - 0.370	816	613.28	+33.1%
NEWE - 0.428	944	727.60	+29.7%
NYCW - 0.391	862	623.78	+38.2%
"None" - 0.692	1526	1238.52 (US Ave)	+23.2%

- 5) Other public comments will provide estimates that are more realistic.

GEW31-14

GEW32-14

602.1.2.1, Table 602.1.2.1, 602.2.1, Table 602.2.1

Proposed Change as Submitted

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	2.51 <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	3.11 <u>3.23</u>
SRVC	SERC Virginia/Carolina	3.13 <u>3.14</u>
SPNO	SPP North	3.53 <u>3.69</u>

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB- REGION NAME	ENERGY CONVERSION FACTOR
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 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 CO₂e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	4270 <u>1647</u>
AKMS	ASCC Miscellaneous	545 <u>1826</u>
ERCT	ERCOT All	4417 <u>1449</u>
FRCC	FRCC All	4416 <u>1579</u>
HIMS	HICC Miscellaneous	4595 <u>2046</u>
HIOA	HICC Oahu	48594 <u>2046</u>
MORE <u>MROE</u>	MRO East	4974 <u>2135</u>
MROW	MRO West	4957 <u>2432</u>
NYLI	NPCC Long Island	4654 <u>1678</u>
NEWE	NPCC New England	999 <u>1402</u>
NYCW	NPCC NYC/Westchester	874 <u>1408</u>
NYUP	NPCC Upstate NY	774 <u>1584</u>
RFCE	RFC East	4224 <u>1874</u>
RFCM	RFC Michigan	4680 <u>2084</u>
RFCW	RFC West	4652 <u>2463</u>
SRMW	SERC Midwest	4966 <u>2463</u>
SRMV	SERC Mississippi Valley	4094 <u>1504</u>
SRSO	SERC South	4604 <u>1864</u>
SRTV	SERC Tennessee Valley	4623 <u>2160</u>

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
SRVC	SERC Virginia/Carolina	4220 <u>1923</u>
SPNO	SPP North	2406 <u>2451</u>
SPSO	SPP South	4780 <u>1818</u>
CAMX	WECC California	768 <u>1294</u>
NWPP	WECC Northwest	958 <u>1698</u>
RMPA	WECC Rockies	4999 <u>2088</u>
AZNM	WECC Southwest	4394 <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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee preferred the changes reflected in GEW31-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Neil Leslie, representing self (neil.leslie@gastechnology.org) requests Approve as Submitted.

Commenter's Reason: The non-baseload methodology that forms the basis of the proposed change provides the most suitable conversion factors for evaluating the impact of technology choices under the performance path.

GEW32-14

GEW33-14

602.1.2.1, Table 602.1.2.1, 602.2.1, Table 602.2.1

Proposed Change as Submitted

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	3.01 <u>2.94</u>
NYCW	NPCC NYC/Westchester	3.32 <u>3.09</u>
NYUP	NPCC Upstate NY	2.51 <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	3.11 <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>

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	ENERGY CONVERSION FACTOR
CAMX	WECC California	2.64 <u>2.93</u>
NWPP	WECC Northwest	2.26 <u>2.36</u>
RMPA	WECC Rockies	3.48 <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	4270 <u>1577</u>
AKMS	ASCC Miscellaneous	545 <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	1974 <u>1813</u>
MROW	MRO West	1957 <u>1851</u>
NYLI	NPCC Long Island	1654 <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	1604 <u>1519</u>
SRTV	SERC Tennessee Valley	1623 <u>1538</u>
SRVC	SERC Virginia/Carolina	1220 <u>1180</u>

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh)
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	1394 <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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee preferred the changes incorporated in GEW31-14.

Assembly Action:

None

Public Comment 1:

Ben Edwards, representing self, requests Approve as Submitted.

Commenter's Reason: EPA's eGRID values are the basis of the current code. The Committee approved GEW31 based on citable values in ASHRAE Standard 105-2014. The values in this proposal are also citable, and it includes more current eGRID data.

Public Comment 2:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	3.27 <u>2.95</u>

eGRID 2007 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKMS	ASCC Miscellaneous	1.93 <u>0.90</u>
ERCT	ERCOT All	3.11 <u>2.28</u>
FRCC	FRCC All	3.17 <u>2.43</u>
HIMS	HICC Miscellaneous	3.78 <u>2.63</u>
HIOA	HICC Oahu	3.29 <u>2.98</u>
MROE	MRO East	3.28 <u>2.50</u>
MROW	MRO West	3.49 <u>2.36</u>
NYLI	NPCC Long Island	3.41 <u>3.23</u>
NEWE	NPCC New England	2.94 <u>1.58</u>
NYCW	NPCC NYC/Westchester	3.09 <u>1.71</u>
NYUP	NPCC Upstate NY	2.55 <u>1.08</u>
RFCE	RFC East	3.23 <u>1.75</u>
RFCM	RFC Michigan	3.29 <u>2.62</u>
RFCW	RFC West	3.27 <u>2.31</u>
SRMW	SERC Midwest	3.33 <u>2.73</u>
SRMV	SERC Mississippi Valley	3.13 <u>2.13</u>
SRSO	SERC South	3.06 <u>2.34</u>
SRTV	SERC Tennessee Valley	3.10 <u>2.21</u>
SRVC	SERC Virginia/Carolina	3.23 <u>1.80</u>
SPNO	SPP North	3.58 <u>2.80</u>
SPSO	SPP South	3.22 <u>2.84</u>
CAMX	WECC California	2.93 <u>1.52</u>
NWPP	WECC Northwest	2.36 <u>1.44</u>
RMPA	WECC Rockies	3.48 <u>3.05</u>
AZNM	WECC Southwest	3.18 <u>2.14</u>

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 SUB-REGION ACRONYM	eGRID SUB-REGION NAME	<u>2010</u> CO₂e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	1577 <u>1260</u>

eGRID SUB-REGION ACRONYM	eGRID SUB-REGION NAME	<u>2010</u> CO ₂ e RATE (lbs/MWh)
AKMS	ASCC Miscellaneous	639 <u>450</u>
ERCT	ERCOT All	1445 <u>1223</u>
FRCC	FRCC All	1322 <u>1202</u>
HIMS	HICC Miscellaneous	1566 <u>1336</u>
HIOA	HICC Oahu	1873 <u>1631</u>
MORE <u>MROE</u>	MRO East	1813 <u>1620</u>
MROW	MRO West	1851 <u>1545</u>
NYLI	NPCC Long Island	1447 <u>1341</u>
NEWE	NPCC New England	813 <u>728</u>
NYCW	NPCC NYC/Westchester	768 <u>624</u>
NYUP	NPCC Upstate NY	590 <u>548</u>
RFCE	RFC East	1065 <u>1007</u>
RFCM	RFC Michigan	1874 <u>1638</u>
RFCW	RFC West	1711 <u>1512</u>
SRMW	SERC Midwest	1976 <u>1820</u>
SRMV	SERC Mississippi Valley	1221 <u>1034</u>
SRSO	SERC South	1519 <u>1361</u>
SRTV	SERC Tennessee Valley	1538 <u>1397</u>
SRVC	SERC Virginia/Carolina	1180 <u>1080</u>
SPNO	SPP North	2062 <u>1809</u>
SPSO	SPP South	1860 <u>1588</u>
CAMX	WECC California	835 <u>613</u>
NWPP	WECC Northwest	959 <u>847</u>
RMPA	WECC Rockies	2131 <u>1906</u>
AZNM	WECC Southwest	1428 <u>1183</u>

Commenter's Reason: If upstream estimates are to be used, then the estimates should be as up to date as possible. The revisions for Table 602.1.2.1 are based on the values found in the eGRID spreadsheets, which can be found at the following web site:<http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html> file name eGRID_9th_edition_V1-0_year_2010_Data.xls

The calculations used can be found on the attached spreadsheet

For Table 602.1.2.2, the values are from the Summary Tables, page 1, entitled "Year 2010 eGRID Subregion Emissions - Greenhouse Gases" which can be found at the following web site:http://www.epa.gov/cleanenergy/documents/egridzips/eGRID_9th_edition_V1-0_year_2010_Summary_Tables.pdf

Buildings use energy and save energy at all times of the day, not just "at the margin". If these estimated values are to be part of the standard, then the estimated values derived on an annualized basis should be used.

GEW33-14

GEW34-14

Table 602.2.1, 602.2.3, 603.5.1

Proposed Change as Submitted

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 2012 SUB-REGION ACRONYM	eGRID 2007 2012 SUB-REGION NAME	2005 2009 CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	4270 <u>1281</u>
AKMS	ASCC Miscellaneous	515 <u>521</u>
ERCT	ERCOT All	4417 <u>1182</u>
FRCC	FRCC All	4416 <u>1177</u>
HIMS	HICC Miscellaneous	1595 <u>1352</u>
HIOA	HICC Oahu	18594 <u>1593</u>
<u>MORE MROE</u>	MRO East	1974 <u>1592</u>
MROW	MRO West	1957 <u>1629</u>
NYLI	NPCC Long Island	1654 <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 MD and DE)</u>	RFC East	1224 <u>947</u>
RFCM	RFC Michigan	1680 <u>1659</u>
RFCW <u>(except MD)</u>	RFC West	1652 <u>1521</u>
SRMW	SERC Midwest	1966 <u>1750</u>
SRMV	SERC Mississippi Valley	1094 <u>1022</u>
SRSO	SERC South	1604 <u>1326</u>
SRTV	SERC Tennessee Valley	1623 <u>1358</u>
SRVC	SERC Virginia/Carolina	1220 <u>1036</u>
SPNO	SPP North	2106 <u>1816</u>

eGRID 2007 2012 SUB-REGION ACRONYM	eGRID 2007 2012 SUB-REGION NAME	2005 2009 CO ₂ e RATE (lbs/MWh)
SPSO	SPP South	4780 1599
CAMX	WECC California	768 0
NWPP (except CA)	WECC Northwest	958 819
RMPA	WECC Rockies	4999 1825
AZNM (except CA)	WECC Southwest	4394 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee preferred the changes incorporated in GEW31-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 2012-9th EDITION VERSION 1.0 SUB-REGION ACRONYM	eGRID 2012 SUB-REGION NAME	2009 2010 CO₂e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	1281 1259.64
AKMS	ASCC Miscellaneous	521 450.1
ERCT	ERCOT All	4182 1222.88
FRCC	FRCC All	4177 1201.79
HIMS	HICC Miscellaneous	4352 1336.02
HIOA	HICC Oahu	4593 1630.90
MROE	MRO East	4592 1619.84
MROW	MRO West	4629 1545.11
NYLI	NPCC Long Island	0 1341.01
NEWE	NPCC New England	0 727.60
NYCW	NPCC NYC/Westchester	0 623.78

NYUP	NPCC Upstate NY	0 <u>548.37</u>
RFCE (except MD and DE)	RFC East	947 <u>1007.04</u>
RFCM	RFC Michigan	1659 <u>1638.34</u>
RFCW (except MD)	RFC West	1521 <u>1511.52</u>
SRMW	SERC Midwest	1750 <u>1820.43</u>
SRMV	SERC Mississippi Valley	1022 <u>1033.58</u>
SRSO	SERC South	1326 <u>1361.05</u>
SRTV	SERC Tennessee Valley	1358 <u>1396.52</u>
SRVC	SERC Virginia/Carolina	1036 <u>1079.57</u>
SPNO	SPP North	1816 <u>1808.76</u>
SPSO	SPP South	1599 <u>1587.55</u>
CAMX	WECC California	0 <u>613.28</u>
NWPP (except CA)	WECC Northwest	819 <u>846.97</u>
RMPA	WECC Rockies	1825 <u>1906.27</u>
AZNM (except CA)	WECC Southwest	1191 <u>1182.89</u>

a. Sources: EPA eGRID 2012 Version 1.0 2009 data; EPA eGrid regional gross grid loss factor.

Commenter's Reason: This public comment updates the values in the table to the most current available from EPA's eGRID 9th Edition, Version 1.0 published in February of this year.

Public Comment 2:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 2012 SUB-REGION ACRONYM	eGRID 2012 SUB-REGION NAME	2009 CO ₂ e RATE (lbs/MWh)
AKGD	ASCC Alaska Grid	1281
AKMS	ASCC Miscellaneous	521
ERCT	ERCOT All	1182
FRCC	FRCC All	1177
HIMS	HICC Miscellaneous	1352
HIOA	HICC Oahu	1593
MROE	MRO East	1592
MROW	MRO West	1629
NYLI	NPCC Long Island	0 <u>1348</u>
NEWE	NPCC New England	0 <u>728</u>
NYCW	NPCC NYC/Westchester	0 <u>611</u>
NYUP	NPCC Upstate NY	0 <u>498</u>
RFCE (except MD and DE)	RFC East	947
RFCM	RFC Michigan	1659
RFCW (except MD)	RFC West	1521
SRMW	SERC Midwest	1750
SRMV	SERC Mississippi Valley	1022
SRSO	SERC South	1326

eGRID 2012 SUB-REGION ACRONYM	eGRID 2012 SUB-REGION NAME	2009 CO ₂ e RATE (lbs/MWh)
SRTV	SERC Tennessee Valley	1358
SRVC	SERC Virginia/Carolina	1036
SPNO	SPP North	1816
SPSO	SPP South	1599
CAMX	WECC California	9 661
NWPP (except CA)	WECC Northwest	819
RMPA	WECC Rockies	1825
AZNM (except CA)	WECC Southwest	1191

a. Sources: EPA eGRID 2012 Version 1.0 2009 data; EPA eGrid regional gross grid loss factor.

Commenter's Reason: This will provide the other values from eGRID for calendar year 2009.

GEW34-14

GEW35-14

602.2.1, Table 602.2.1

Proposed Change as Submitted

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	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

eGRID 2007 SUB-REGION ACRONYM	eGRID 2007 SUB-REGION NAME	2005 CO ₂ e RATE AFTER 2015 (lbs/MWh)
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: 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal tries to address the quickly changing landscape of emission rates and the issuance and potential issuance of new power plant emission standard by EPA. The committee acknowledged the issue, but the proposal doesn't provide the vehicle for resolution. The most current rates have been approved via GEW31-14.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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
INDIRECT ELECTRICITY EMISSION RATE**

Location	CO₂e RATE after 2015 2016 (lbs/MWh)
All Regions of the US	0.0 <u>eGRID values for 2012 * 0.7</u>

Commenter's Reason: Under the EPA proposed rule that was issued in June, 2014, existing power plants will have to reduce emissions by 30% compared to 2012 levels. State implementation plans will be due to EPA by June of 2016.

Therefore, to be consistent with national policy going forward, for buildings being built in the future, the estimates associated with upstream power plants should reflect what will happen. The EPA baseline will be 2012 values, and the reductions will use the 2012 values as the baseline. Since EPA is requiring a 30% reduction, the table reflects the result of this policy by 2030 - well within the lifetime of any new building.

GEW35-14

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

Proposed Change as Submitted

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 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal removes the requirement to monitor the information produced from the meters. Further it removes all submetering of tenants which will eliminate the ability for individual tenants to monitor their energy use.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Craig Conner, representing self (craig.conner@mac.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

603.1.1 Buildings with multiple tenants. In buildings with more than one tenant, the metering required by Section 603.3 shall be provided for the entire building and for each tenant space individually. Each tenant shall have access to data collected for their space.

Exception: Individual meters shall not be required for tenant spaces less than 2,000 square feet (186 m²).

Commenter's Reason: There are two main reasons for approving GEW40. First, the existing IGCC neglected to meter service water heating. At best it is in the other miscellaneous category (with vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains and fireplaces, swimming pools, inground spas, snow-melt systems, and exterior lighting). Water heating used for space heating is metered in the HVAC category. No other proposals this cycle specifies metering service water heating. For some occupancies service water heating can be a major energy use, and should be metered separately.

The second reason to approve GEW40 AM is to simplify the existing overly complicated section on metering.

This AM proposal makes one amendment to the original proposal, it adds back tenant metering. Comments at the hearing suggested the separate metering should be retained for tenants. However the committee reason for disapproving GEW41 suggested smaller tenant spaces should not require metering. The tenant metering section is added back with a requirement to meter tenants with 2000 square feet or more separately.

The reformatting of the Section 603.2 to add an end use table as was approved in GEW42 is an improvement that should be retained.

GEW40-14

GEW41-14

603.1.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee generally viewed the proposal as a positive improvement in the clarity of the section. There was also support for exempting smaller tenant spaces from the submetering requirement, but felt that 5000 square feet was too large an exemption threshold

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jim Edelson, representing New Buildings Institute requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

603.1.1 Buildings with multiple tenants. In buildings with more than one tenant, the metering required by Section 603.3 shall be provided for the entire building and for each tenant space individually. 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 2000 square feet (465 186 m²).

Commenter's Reason: The load type segregation requirements of Section 603.2 can require three to five meters to meet the tenant submetering requirements of 603.1.1 (depending on how many the five load types are delivered to the tenant space). Since in most cases loads will need to be delivered separately to the tenant space, they must be separately metered, and each tenant space of any size would need to have one meter for each load type.

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. The Committee thought the threshold for the exemption at 5000 square feet was set too high. This comment reduces that threshold and exempts tenant spaces only under 2,000 square feet from the submetering requirements.

GEW41-14

GEW49-14

603.3.7.6 (New), 603.3.7.7 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee disapproved GEW136-14 which would have included the various alternative fuels into the renewable energy section. Until such time as they are in the code, there would be no need to provide for their metering and monitoring

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Submitted.

Commenter's Reason: This proposal is being resubmitted as a public comment. The Committee stated that its reason for disapproving the proposal was because there was no need for it since it had denied GEW136. Without GEW136, there would be no biogas provisions in the IGCC.

In the event GEW136 is brought back as a public comment, this proposal should be approved.

Public Comment 2:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 or measured 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 or measured.

603.3.7.7 Biomass energy systems. Equipment and systems providing energy through the use of biomass shall be capable of being metered or measured 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 or measured.

Commenter's Reason: The revisions will provide more flexibility in terms of how the energy output of these systems is obtained and tracked.

GEW49-14

GEW50-14

603.4, 603.4.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The change would limit the application of these two sections to electric energy. The committee felt that all energy sources should be retained in these sections

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Ted Williams, representing American Gas Association requests Approve as Submitted.

Commenter's Reason: The proposal should be approved as submitted. Load type submetering is only relevant to electrical loads where data on submetered loads may provide information on demand management for load control and dispatching of electric generation assets that have the lowest environmental footprint. Load type submetering on other energy form uses provides no comparable benefit.

Public Comment 2:

ME Krebs, representing Laclede Gas (mkrebs@lacledegas.com) requests Approve as Submitted.

Commenter's Reason: As an affected stakeholder, I believe that the rationale stated by the American Gas Association's Paul Cabot is sound yet insufficient. The insufficiency is that the explanation of the negative impacts of sub-metering natural gas does not properly convey the potential for institutionalizing a bias against the direct use of natural gas. The problem is that sub-metering electric loads is relatively easy and cheap whereas sub-metering gas end loads is both complex and expensive; perhaps prohibitively so. Inadvertently or not, this may move the building towards more inefficient use of fossil fuels (via electricity) and subsequent emissions. With this additional rationale, I urge the committee to reconsider and approve GEW 50-14 as originally submitted by Paul Cabot.

GEW50-14

GEW52-14

603.5.1, 603.6

Proposed Change as Submitted

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~~ 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The added requirements do not appear to add value toward the goals of this code. It was felt that it would be misleading to report some of the CO₂ emissions on a daily basis and not all of such.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Submitted.

Commenter's Reason: This proposal simply refines existing requirements of the code and will not add additional cost in either materials or labor.

Firstly, the proposal requires data acquisition systems to be able to parse acquired data into daily increments. This is already done by all products in the market.

Moreover, building owners don't have to make the calculations -- the requirement is simply that they have the capability to do so if they choose.

With respect to the building energy display, the direct emissions can be an input from an emissions monitoring system but it can also be simply a computed value using energy consumption and the default emissions rate found in Table 602.2.2.

This is a green standard and daily emissions and direct emissions are important data for building owners and managers.

Public Comment 2:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

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 13 months.
4. The current direct and indirect emissions for building equipment, updated for each fuel type.
5. The total direct and indirect emissions of building equipment for the previous day and the same day the previous year.
6. The total direct and indirect emissions of building equipment for the previous 13 months.

Commenter's Reason: The revisions provided will meet the concerns of the committee, and such a display will add more value to the code and to the display.

GEW52-14

GEW54-14

202, 604.1, 604.2, 604.3, 604.3.1 (New), 604.4, 611.3.3.5 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

604.4 Lighting. Where buildings in Group B office occupancies, Group E occupancies and Group M occupancies 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

(The remainder of the proposal remains unmodified.)

Committee Reason: The proposal was modified to limit the application of the lighting requirement to buildings in Groups B, E and M occupancies. This was seen as the appropriate application of these provisions at this time. The committee found the overall proposal a good update and revision to this complex section.

Assembly Action:

None

Public Comment 1:

Steven Rosenstock, Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

SECTION 202 DEFINITIONS

DEMAND RESPONSE PERIOD. A period of time during which electricity or other fossil fuel loads are modified in response to a demand response signal.

DEMAND RESPONSE SIGNAL. A signal sent by the local utility, gas utility, energy provider, independent system operator (ISO), or designated curtailment service provider or aggregator, to a customer, indicating a price or a request to modify electricity or fossil fuel consumption, for a limited time period.

OCCUPANT CONTROLLED SMART THERMOSTAT. A control device that is capable of both receiving and responding to demand response signals with limited or full occupant override capabilities.

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.

Exception: Auto-DR infrastructure is not required for the following;buildings and systems:

1. Buildings located where the electric utility or gas utility, energy provider, 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 or fossil fuel 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 or fossil fuel 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.

604.3 Heating, ventilating and air-conditioning (HVAC) systems not equipped with DDC.

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, packaged terminal air conditioners, and packaged terminal 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 where allowed by the demand response program.
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, whichever is greater.
5. In response to demand response signals, the OCST shall default to an event response that initiates setpoint offsets of +4°F or more for cooling and -4°F or more 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 room temperature and the current setpoint.

Commenter's Reason: The proposed modifications will clarify the proposal and provide language that will make the code more compatible with different types of demand response programs.

Public Comment 2:

Jonathan Siu, City of Seattle, Dept of Planning & Development, representing Washington Association of Building Officials Technical Code Development Committee (jon.siu@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal 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 be provided with Auto-DR infrastructure in accordance 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 removal and smoke control systems.
6. Means of egress illumination required by Chapter 10 of the International Building Code.
- 6Z. Manufacturing process systems

78. 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.
89. Systems serving process loads where constant temperatures are necessary to prevent degradation of plants, animals, or other temperature-sensitive materials.

Commenter's Reason: The first change to the main paragraph is an editorial fix to clean up the charging language.

The changes to the exception are intended to exempt emergency systems required by the building code from Auto-DR requirements. Critical systems to deal with smoke include smoke removal (IBC Section 403.4.7) and smoke control (IBC Section 909), not just smoke exhaust systems. Similarly, egress lighting should not be overridden by Auto-DR control systems, since they may need to operate at any time.

GEW54-14

GEW57-14

604.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The original intent of the code in this section is to address electrical demand. The proposal would imply that there is also a requirement imposed on the provision of gas. The resulting code would be confusing.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Submitted.

Commenter's Reason: During the last winter, there were numerous reports of propane shortages throughout the continental U.S. as shown in the following story:

<http://finance.yahoo.com/news/u-propane-shortage-hits-millions-164337796.html>

"Prices of the fuel, a liquefied petroleum gas, have rocketed to all-time highs in Midwestern states, distributors are rationing supplies, and some schools have shut due to a lack of the fuel during this year's second bout of Arctic weather."

"The U.S. Department of Transportation has issued emergency orders suspending the limits on the amount of time truck drivers can spend on the road for 10 Midwestern states and 12 Northeastern states, a rare regional order."

"A spokesman for Pennsylvania-based AmeriGas, the largest U.S. propane retailer, said it was rationing deliveries to "small pockets" of Alabama, Georgia and Tennessee on Thursday, reducing supplies to 100 gallons per customer from the standard delivery of some 250 gallons."

Gas utilities themselves have offered "interruptable" rates to certain customers that agree to have their service curtailed during periods when gas demand exceeds supply since the 1970's.

Because of new techniques in drilling, natural gas supplies have grown dramatically over the last decade. With lower prices, consumer demand can be expected to rise.

Even with increased supplies, there can be issues with delivery during "peak" demand days, due to pipeline constraints or other operational issues.

The Committee stated that the intent of the section was to apply only to electricity. A plain language read of the section doesn't reveal such an intent but, assuming that it was the intent at some point, it shouldn't be the intent now.

The IGCC appropriately addresses electric peak demands and it should also address gas peak demands.

Bibliography: <http://finance.yahoo.com/news/u-propane-shortage-hits-millions-164337796.html>

Public Comment 2:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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~~ fossil fuel 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.

Commenter's Reason: This modification will help to clarify the proposal. A good green building will not increase any type of energy demand over the standard reference design. This will help prevent game playing and fuel switching.

GEW57-14

GEW58-14

604.1

Proposed Change as Submitted

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~~ 1. Buildings with a peak electric demand not greater than 0.75 times that of the standard reference design.
- ~~3~~ 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Deleting the exception would result in requiring an Auto DR system to be installed even in locations where the utility isn't set up to take advantage of such systems. It would also impact small buildings, imposing costs for a system the local utility may never operate. The committee felt this was somewhat of a chicken and egg issue and therefore felt this needed to remain a local option where, locally, the availability of the utility having the infrastructure to utilize Auto DR's systems installed in buildings.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Meg Waltner, representing Natural Resources Defense Council (mwaltner@nrdc.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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.

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

1. Buildings that are less than 25,000 square feet (2323 m²) in total building floor area and 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.

Commenter's Reason: Demand response (DR) allows building owners to reduce their energy use and costs while increasing grid reliability, in particular during peak loads. DR helps prevent blackouts during extreme weather events and is becoming an increasingly important resource to help manage variable demand. Wide variations in the shape of the electricity load demand curve is rapidly becoming a critical grid issue in many areas of the country with the increased rate of PV installations.

Section 604 requires certain building types to include controls that are able to adjust the energy used by the building's HVAC and lighting systems in response to a signal from the grid operator or other automated source. Section 604 is a jurisdictional elective, meaning that it is only effective in jurisdictions that positively select it.

If a jurisdiction elects to have the requirements of Section 604 apply, this indicates that there is likely a need for demand response in that jurisdiction. If there aren't currently existing programs in these jurisdiction, there will likely be so in the near future. In order for DR programs to serve the grid, they need DR resources, and removing the exemption for buildings over 25000 square feet would help build this resource. Given that the jurisdiction has positively elected this requirement, it clearly values DR and sees a need for DR capabilities in commercial buildings going forward. For these jurisdictions, the requirements of Section 604 should apply to large buildings when the IgCC takes effect, not be delayed until a DR program is formally implemented by the utility.

This comment would continue to exempt small buildings and directly addresses the committee's concern that the original proposal would adversely affect small buildings. The 25000 square feet threshold matches the threshold set for mandatory submeters in Section 603.4 of the IgCC.

GEW58-14

GEW60-14

604.4

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee was not convinced that removal of the exception, that being to not have the emergency lights circuits, was appropriate.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Glenn Heinmiller, Lam Partners, representing International Association of Lighting Designers (glenn@lampartners.com) requests Approve as Submitted.

Commenter's Reason: The Committee misunderstood the proposal. The proposal does not change the exemption of emergency lighting from Auto DR requirements. The proposal only simplifies the exceptions by removing redundant or unnecessary language, and provides alignment with IECC. There is no change in stringency. The original reason statement is still complete and valid. This proposal just simplifies and clarifies the code, nothing more.

GEW60-14

GEW62-14

202 (New), 604.5 (New)

Proposed Change as Submitted

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 storage 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-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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee found that adding criteria for storage systems to the AUTO DR provisions both timely and appropriate. Such systems are already being installed. This gives the designer of the system more flexibility. It gives the local official criteria by which to evaluate and approve the system.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

ME Krebs, representing Laclede Gas (mkrebs@lacledegas.com) requests Disapprove.

Commenter's Reason: GEW 62-14 should be disapproved because it specifically and unfairly discriminates against common non-electric forms of energy storage such as propane or diesel. It also fails to acknowledge that "energy storage" does not necessarily mean on-site energy storage. For example, natural gas is stored; typically in deep underground "salt domes," which is dispatchable via gas transmission and distribution systems to both gas utilities and electric utilities (for gas-fueled electrical generation).

In addition, GEW-62 sets the stage for GEW-63 inclusion of inefficient technologies such as electric resistance heat to be stored. Assuming that the Committee rejects this request, it should insure that the inefficient nature of such form of electric energy storage are properly accounted for by full fuel-cycle methodologies; as should the increased environmental emissions caused by such inefficiencies.

Public Comment 2:

Ted Williams, representing American Gas Association requests Disapprove.

Commenter's Reason: While energy storage systems are extremely important, the proposal is unnecessarily restricted to electricity-sourced energy. Thermal storage systems, even as a means for alleviating electric loads, may be gas fired. This proposal would not recognize such systems and, as such, are design restrictive.

GEW62-14

GEW63-14

202 (New), 604.3

Proposed Change as Submitted

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 fuels 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>

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee saw this as a companion proposal with GEW62-14, which they also approved. This proposal provides appropriate definitions for these systems. It is also appropriate to list GETS as one of the strategies appropriate to AUTO-DR systems.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

ME Krebs, representing Laclede Gas (mkrebs@lacledegas.com) requests Disapprove.

Commenter's Reason: At a minimum, the excerpt shown below is a ploy to promote highly inefficient electric resistance water heating under the guise of "demand response." I urge the committee to acknowledge it as such and disapprove.

Add new definition as follows

Book

2012 International Green Construction Code

Section

202

Title

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)

Public Comment 2:

Ted Williams, representing American Gas Association requests Disapprove.

Commenter's Reason: Grid-Interactive Electric Thermal Storage (GETS) is a term of art and is not sufficiently defined in proper standards for technology and equipment. The IgCC should not promulgate definitions for a broad range of technologies for which limited or no standardized definitions exist. With respect to electric storage water heaters, GETS-type systems, controls are not covered by national consensus standards and provide great opportunities for abusive operating practices at odds with load control goals. All GETS-type electric storage water heaters provide a consumer override of load control functions that may render grid-interactive load control obsolete. Until standards coverage of these functions is addressed, a discrepancy exists between how that appliance "ought to" be operated and how it is "will" be operated. Beyond GETS-type electric storage water heaters, whose baseline efficiency is covered by Federal minimum efficiency standards, other types of thermal storage systems are not covered by any national consensus standards in terms of their design or operation. Clearer definition of these technologies is needed and standards coverage developed before model codes "define" those technologies. Additionally, the restriction of thermal storage systems to electric thermal storage is unduly restrictive since thermal storage, even to alleviate peak electrical demands, need not be electricity powered.

GEW63-14

GEW64-14

605.1.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal was rejected because removal of the section eliminates a key enhanced envelope requirement without replacing it with any other changes to the code. Perhaps if there were other changes which increased envelope efficiency in the IECC, this broad brush provision could be eliminated. The 10% broad brush approach is acknowledged as problematic in determining and showing compliance, but it just because it's difficult, doesn't justify its removal without some sort of balancing the loss.

Assembly Motion:

Approved as Submitted

Online Vote Results:

Failed - Support: 48.63% (89) Oppose: 51.37% (94)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Jay Johnson, representing Thomas Associates, Inc., Metal Building Manufacturers Association (jjohnson@thomasamc.com) requests Approve as Submitted.

Commenter's Reason: We respectfully disagree with the code development committee reason for disapproval. Our position is that the prescriptive building envelope provisions referenced in the IECC 2015 has reach its point of diminishing returns to gain energy efficiency. Adding an additional stringency over and above the referenced IECC is not necessary.

Over the past 5 years both the IECC and ASHRAE codes and standards organizations have made significant strides towards increasing the stringency of their energy efficiency requirements. These increases were based upon various energy models of actual buildings and end uses and estimates of increased cost of energy. These new standards were carefully studied and determined to be a practical balance between being both reasonably achievable, highly energy efficient, and affordable.

This proposal removes the arbitrary 10% increase in stringency that has no technical merit or any basis for further increasing building envelope efficiency. An arbitrary percentage increase in stringency results in little to no benefit when you consider the already low U-factors of 2015 IECC code compliant assemblies. The 10% would however add a level of complexity and judgment regarding compliance that could be avoided by simply referring to the recognized 2015 IECC building envelope provisions, which in and of itself has reach its point of diminishing returns.

Public Comment 2:

Mark Nowak, representing Steel Framing Alliance requests Approve as Submitted.

Commenter's Reason: The proposal as submitted will improve the code by eliminating arbitrary U-factor, C-factor, and F-factor modifications that result in little to no savings in warm climates and SHGC values that will produce less efficient buildings in colder climates.

Public Comment 3:

Julie Ruth, representing American Architectural Manufacturers Association (julruth@aol.com) requests Approve as Submitted.

Commenter's Reason: This Public Comment seeks approval of GEW64 as submitted. Approval of GEW64 would remove the problematic provisions of Section 605.1.1 in their entirety. Section 605.1.1 requires the building envelope U-factor, C-factor, F-factor and SHGC be 10% lower than that prescribed in the prescriptive provisions of the IECC for commercial buildings.

In its consideration of GEW64 the code change committee suggested that replacement language be offered rather than deleting the current criteria completely. This suggestion assumes that the current language provides some value to the IgCC. It does not. In many instances reducing these factors by 10% will NOT result in a 10% reduction in energy usage. In some cases it may even result in an increase in energy usage.

One example of this is with regards to lowering the maximum permitted SHGC by 10%. The maximum SHGC permitted for fenestration oriented to the south in Climate zones 1, 2 and 3 in commercial buildings without overhanging projections under the 2015 IECC is 0.25. Reducing this by 10% would result in a maximum SHGC of 0.22 for the same installation under the 2015 IgCC.

40% of the energy wavelengths emitted by the sun are in the range of visible light. Restricting the maximum SHGC of a fenestration product to 0.22 could mean that almost half the available light from the sun $((0.40-0.22)/0.40) = 45\%$ is prevented from passing through that product. This can not only increase the overall lighting load for the building, it may also increase the cooling load due to the additional heat given off by the required, additional artificial lighting in the building.

In other climate zones the potential energy savings from reducing SHGC during the cooling season is not sufficient to counter the increase in heating load during the heating season. This situation is aggravated by reducing the maximum SHGC by 10%. For example, the maximum SHGC permitted for fenestration in commercial buildings without overhanging projections and oriented to the south in Climate Zone 8, under the 2015 IECC, will be 0.45. Reducing this SHGC by 10% results in a maximum SHGC of 0.40. This means that only 40% of the potential heat energy from the sun is provided through the fenestration in a climate zone that has 12,600 Heating Degree Days (HDD). The overall potential increase in heating load due to this is significant.

Another example of the potential, negative ramifications of Section 605.1.1 is the potential effect of reducing the envelope U-factor by 10% in all climate zones. The overall effect of this would be to reduce the heat loss through the building envelope by 10%. This would result in a net energy savings during the heating season in heating dominated climates. But it restricts the ability to cool a building's interior during the transition period in cooling dominated climates, with an overall net increase in potential cooling load in those climates.

Also, the current language does not consider other methods of reducing potential solar heat gain, such as shading devices other than overhanging projections. If overhanging projections greater than a specific size are provided then the 2015 IECC permits an increase in the maximum SHGC of the associated fenestration. Similar provisions are not provided, however, for other types of shading devices. Provisions for automatic shading devices were approved with the approval of GEW72 at the 2014 IgCC Committee Action Hearings in Memphis. Under the current provisions fenestration shaded by these devices, however, would still need to have an SHGC 10% lower than that permitted for unshaded fenestration in the 2015 IECC.

The only way to achieve a targeted level of improvement of energy performance over the IECC is to do performance analysis or outcome based design.

This fact is recognized in Section 302.1.1 of the IgCC. This section limits the use of prescriptive design to commercial buildings < 25,000 sq. ft. in area in jurisdictions that choose to require enhanced energy performance ($zEPI < 47$). Since buildings built to the 2012 IECC are considered to have a zEPI of 57 this limit would apply if a jurisdiction chooses to require an improvement in energy efficiency of 18% (10/57) over the 2012 IECC, or approximately 8-10% over the 2015 IECC.

Section 302.1.1 also specifies that buildings built using prescriptive provisions shall be considered to have a zEPI of 51. This would be a 10% improvement over the 2012 IECC (6/57), which is approximately equivalent to the 2015 IECC.

Therefore, Section 302.1.1 adequately addresses the use of prescriptive design in jurisdictions that choose to seek energy performance that is enhanced beyond that of the IECC. As such, the provisions of Section 605.1.1. are not needed.

Overall, Section 605.5 is overly simplistic and does not guarantee an increase in energy efficiency of the 2015 IgCC over the 2015 IECC. Since the current criteria is of limited benefit to energy efficiency, could be detrimental and the use of prescriptive

design is already adequately addressed in Section 302.1.1, the provisions of Section 605.1.1 should be removed from the IgCC without replacement.

GEW64-14

GEW65-14

605.1.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal is similar to GEW64, but retains the 10% increase for only the colder climates. Climate zones 1 through 5 would be eliminated from the increased stringency of the envelope; these zones cover the majority of the United States. The committee felt that increased efficiency is achievable in all zones, and these 5 should not be excluded.

Assembly Motion:

Approved as Submitted

Online Vote Results:

Failed - Support: 41.34% (74) Oppose: 58.66% (105)

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mark Nowak, representing Steel Framing Alliance (mark@mnowak.net) requests Approve as Modified by this Public Comment.

Modify the proposal 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 the requirements of Tables C402.1.2 and C402.3 of the *International Energy Conservation Code*, In climate zones 6, 7, and 8, each U-factor, C-factor, and F-factor ~~and~~ SHGC in Tables C402.1.2 and C402.3 of the *International*

Energy Conservation Code 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 roof area.

Commenter's Reason: This proposal will reduce the application of an arbitrary U-factor, C-factor, F-factor and SHGC 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 adjustment only to the coldest climate zones where the potential energy savings, although still small, is more significant than in the warmer climates.

During the first hearings, it was pointed out that the code currently requires SHGC values to be reduced in cold climates, resulting in less efficient envelopes in these climate zones. The modification to the original proposal in this public comment corrects this flaw in the current code text as well as the broader arbitrary reduction issues. The committee also recognized that the 10% was problematic and reduced it to 5% in approving GEW 66. This public comment is an overall better solution to the U-factor issue in warmer climates while following the lead established on GEW 66 in colder climate zones.

GEW65-14

GEW66-14

605.1.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal reduces the blanket envelop increased stringency from the current 10% to only 5%. The reduction was considered to be reasonable increase over the increased stringency of the improved IECC. It provides better flexibility for the designer, building owner and contractor to reach the above code goal.

Assembly Motion:

Disapprove

Online Vote Results:

Failed - Support: 48.55% (84) Oppose: 51.45% (89)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Jay Crandell, Applied Building Technology Group LLC, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz) requests Approve as Modified by this Public Comment.

Modify the proposal 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 ~~5~~ 15 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 ~~5~~ 15 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.

Commenter's Reason: The pursuit of sustainable or "green" construction is one of making reasonable incremental advancements, particularly in areas that have a significant impact such as energy efficiency. The clear message from the first hearing is that some level of advancement above the base code is important. However, a 5% change implies an unjustifiably low valuation of energy efficiency, especially for a green code. It also is no simpler to implement and enforce than the current 10% improvement in the IgCC. The current 10% level of improvement in envelope requirements is less than the level of change between many climate zones in the IECC and is, therefore, quite achievable and practical. In fact, even a 20% level of change is consistent with the level of change in envelope requirements between many climate zones in the IECC. Given that a 10% to 20% change is no more significant than the difference between requirements from one climate zone to the next, this public comment recommends a moderate 15% improvement which falls well within the range of envelope requirements and practices that are already in the IECC base code in various climate zones (and which have been largely unchanged between the 2012 and 2015 IECC). For these reasons, the ICC membership is encouraged to vote to support this public comment to modify GEW66 and uphold energy efficiency as an important and practically achievable component of a green code.

Public Comment 2:

Marcelo Hirschler, GBH International, representing North American Flame Retardants Alliance (gbhint@aol.com) requests Disapprove.

Commenter's Reason: Please disapprove this proposal.

The most important way to have a positive effect on the environment is to decrease energy consumption. The intent of the IgCC is to be a significant improvement in energy savings over the traditional energy consumption contained in the IECC. The fact that a 10% improvement in energy savings is difficult to achieve should be an incentive so that the IgCC is not just a rubber stamp but a significant step forward. It is important that the "green seal of approval" provided by the IgCC code be a real improvement.

Public Comment 3:

Garrett Stone, representing Energy Efficient Codes Coalition, (gas@bbrslaw.com); Harry Misuriello, representing American Council for an Energy Efficient Economy (misuriello@verizon.net) request Disapprove.

Commenter's Reason: We recommend that this proposal be Disapproved because it weakens the thermal envelope requirements of the IgCC without justification.

This proposal creates a problem because it focuses only on the IgCC's thermal envelope improvement requirement (over the IECC) and cuts it in half - from 10% to 5%. To be clear, the EECC does not support any decreases in efficiency in the 2015 IgCC, but this decrease is uniquely problematic. The proponent does not explain why such a decrease is warranted, nor why it should come entirely at the expense of the thermal envelope, which is arguably the portion of the building that will be the most permanent over the lifetime of the building. Given the long expected lifetime of building thermal envelope components versus the shorter lifetimes of equipment and lighting, the IgCC should have envelope provisions that at least keep pace with the remainder of the IgCC's requirements. A 10% thermal envelope improvement is reasonable and achievable. To begin compromising the IgCC's "overlay" requirements simply because the base code has improved would defeat the concept of having an overlay code in the first place.

GEW66-14

GEW67-14

605.1.1

Proposed Change as Submitted

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 Conservation 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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was seen as editorial in that 10% of zero is still zero. The added text clarifies how the 10% would apply (or in this case not apply). If the intent of the code isn't served by this resolution, the committee urged alternatives to be presented via public comments.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Martha VanGeem, representing the Portland Cement Association and the Masonry Alliance for Codes and Standards; Emily Lorenz, representing Precast, Prestressed Concrete Institute (emilyblorenz@gmail.com) request Approve as Modified by this Public Comment.

Modify the proposal 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 Conservation Code* provides for no requirement (NR) for the R-value of an assembly, the U-factor is, C-factor, and F-factor are not required to be reduced. Sky Type "C" locations specified in Section 808.4, the skylights shall not exceed 5 percent of the building roof area.

Commenter's Reason: This modification adds C-factor (for below grade walls) and F-factor (for slab-on-grade floors) to the items that do not need to be reduced if the R-value is indicated as NR. This correction reflects an oversight in the original proposal. It is also consistent with how similar language in ASHRAE/IES/USGBC 189.1-2014 (addendum AL) will be worded.

GEW67 is a clarification to the IgCC on how to comply for cases where the R-value is NR in the IECC. Additional reasoning for below grade walls and slabs is found in the original proposal, which intended to include this modification, but did not.

GEW67-14

GEW68-14

605.1.1.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: While the testimony indicated that the shading and SHGC requirements found in the IECC and the IgCC may not be completely compatible, the committee did not agree that deletion of the requirement was the appropriate action.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Garrett Stone, representing Energy Efficient Codes Coalition (gas@bbrslaw.com); Harry Misuriello, representing American Council for an Energy Efficient Economy (misuriello@verizon.net); Maureen Guttman, representing Building Codes Assistance Project request Approve as Submitted.

Commenter's Reason: While we prefer GEW70 to this proposal, we recommend that this proposal be Approved As Submitted if GEW70 is not adopted because it would simplify the IgCC and make it more useful for a wider range of building projects. In the 2012 IgCC, all buildings built to the prescriptive path must use permanent shading devices, unless one of a few extremely narrow exceptions applies. This requirement makes the prescriptive path almost unusable for many commercial green buildings. Permanent shading devices can be used effectively to reduce solar gain, but they are not the only (or even the best) option in most circumstances.

Moreover, the language of Section 605.1.1.1 is inconsistent with the method of calculating projection factors in the IECC and ASHRAE 90.1. It does not make sense to include such a restrictive, complicated requirement in the IgCC, especially if it conflicts with requirements in the IECC and ASHRAE 90.1. GEW68 solves the problem by removing this prescriptive requirement and allowing design professionals to continue to use the broader range of options for reducing solar heat gain offered by the IECC and ASHRAE 90.1.

Finally, if this prescriptive overhang requirement is removed, architects will still retain the option of installing overhangs or more efficient fenestration (lower SHGC) and achieving basically the same energy efficiency under either option. Specifically, the IgCC is based on the IECC, which is neutral between an overhang and improved SHGC - both the IECC and the IgCC offer the architect credit for installing an overhang by offsetting it with a higher fenestration SGHC. As a result, this overly restrictive design requirement does not even provide any energy savings, since the savings from the overhang will be fully offset by a higher SHGC.

GEW68-14

GEW70-14

605.1.1.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Because of the minimum SHGC required in southern climate zones, this proposal would result in eliminating the shading requirement in the climate zones where they would be most effective. The committee felt such an outcome was not appropriate.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Garrett Stone, representing Energy Efficient Codes Coalition (gas@bbrslaw.com); Harry Misuriello, representing American Council for an Energy Efficient Economy (misuriello@verizon.net); Maureen Guttman, representing Building Codes Assistance Project request Approve as Submitted.

Commenter's Reason: We recommend that this proposal be Approved As Submitted because it adds a simple, effective exception to the complicated and design-restrictive permanent shading requirements in Section 605.1.1.1.

Section 605.1.1.1 intends to limit solar heat gain through permanent shading, but it ignores the use of low-SHGC glazing to limit heat gain in a similar and more cost effective manner. Although the IECC and ASHRAE 90.1 both allow permanent shading to be used as part of a strategy to reduce solar heat gain through fenestration, both model codes also allow low-SHGC glazing as another option to achieve that objective. The current IgCC creates an unnecessary, additional requirement for permanent shading, regardless of whether it is the right choice for a specific project and regardless of how much or how little solar heat gain is allowed through the fenestration.

We disagree with the Committee that the SHGC required by the code in southern climates would eliminate the shading requirement in these climates without further improvements. The Committee failed to recognize changes in the 2015 IECC in this area, which sets the maximum prescriptive SHGC at 0.30 (for south, east and west orientations) for vertical fenestration with a projection factor of 0.25 (see Table C402.4). Under the IgCC, such vertical fenestration would be required to be less than or equal to 0.27 SHGC (10% less than IECC Table C402.4 values assuming Section 605.1.1 remains the same in the 2015 IgCC as in the 2012 IgCC).

As a result, if this proposal is adopted, architects will have the option of an overhang and 0.27 SHGC fenestration or no overhang and 0.23 SHGC fenestration (since the IgCC would require 0.23 SHGC with no projection - the IECC's 0.25 SHGC requirement reduced by 10% under Section 605.1.1). This is similar, but more stringent than the choices under the IECC of 0.30 SHGC with a 0.20 or greater PF or 0.25 SHGC without an overhang.

Proponents and stakeholders from a variety of backgrounds all agreed that the IgCC must be simplified. This proposal clearly simplifies the section while maintaining efficiency, and would ultimately make the IgCC easier to adopt and use.

GEW70-14

GEW71-14

605.1.1.1

Proposed Change as Submitted

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 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*.
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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee did not feel a blanket exception was appropriate. There were concerns about a lack of any size limitations; lack of any limitation on use occurring in the vestibule. Perhaps a refinement related to climate zone may be appropriate.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Barry Greive, representing Target Corporation (barry.greive@target.com) requests Approve as Submitted.

Commenter's Reason: The committee felt that the term vestibule was too broad and that it could be confusing. The term is already used and mandated by the IECC in many climate zones. There should be no confusion on what a vestibule is. Many buildings such as those in a main street atmosphere along a public right away will be difficult to be made to comply. If there is a vestibule; there is already a separation from the inside of the building which will address the reason for this code section.

GEW71-14

GEW77-14

202 (New), 605.1.2.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapprove

This code change proposal was heard by the IgCC General Committee.

Committee Reason: As the proposed information addresses existing buildings, it belongs in Chapter 10 of the International Green Construction Code, which also addresses existing buildings.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jason Wilen, National Roofing Contractors Association (NRCA) (jwilen@nrca.net) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

202 ROOF RECOVER. The process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

202 ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

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.~~

1003.2.8 Air barriers for roof repair, roof recover and roof replacement. For buildings where the energy use 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.

Commenter's Reason: For this proposal, the following Committee Reason appears in the Report of Committee Action Hearings: "As the proposed information address existing buildings, it belongs in Chapter 10 of the International Green Construction Code, which also addresses existing buildings."

This Public Comment complies with the direction given by the IgCC General Committee by moving the proposed text to IgCC Chapter 10.

The purpose of this code change is to make IgCC text consistent with IECC because of a Public Comment for proposal CE165-13 that was approved during the Group B Public Comment Hearings.

The proposed definitions will also make IgCC consistent with proposal CE56-13 that was part of the consent agenda during the Group B Public Comment Hearing.

GEW77-14

GEW78-14

605.1.2.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee approved the change as providing a compliance option when the test alone doesn't show compliance. There was concern expressed regarding the vagueness of some of the terms in the text such as the term 'practicable'. Also of concern is there was no upper limit as to how badly a test result might exceed the 0.25 cfm/ft² limit.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

**Jay Crandell, Applied Building Technology Group LLC, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz) requests
Approve as Modified by this Public Comment.**

Modify the proposal as follows:

605.1.2.2 Testing requirement. The building thermal envelope air tightness shall be tested and the air leakage rate of the total area of the building thermal envelope 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. Where the tested rate exceeds 0.25 cfm/ft², leaks shall be sealed to the extent practicable and another test conducted to confirm the difference between the initial tested

~~air leakage rate and the required rate is reduced by at least 50 percent. A report that includes the tested surface area, floor area, air by volume, stories above grade, corrective actions taken when a second test was required, 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.~~

Commenter's Reason: You can drive a bus through the envelope with the currently approved language in GEW78 and still result in compliance without any confirmation that a reasonable attempt was made to meet or even come close to the required air leakage rate. This proposal addresses that problem and provides flexibility should a failed test occur with some assurance that a reasonable effort was made to meet the required air leakage rate.

GEW78-14

GEW81-14

605.2

Proposed Change as Submitted

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 this 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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Provisions for insulation on roof replacements are now found in the IECC. This IgCC provision is now redundant

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Mike Fischer, CPI, representing The Center for the Polyurethanes Industry (mfischer@kellenccompany.com) requests Disapprove.

Commenter's Reason: This proposal inadvertently removes a needed reference to ensure that buildings undergoing roof replacements meet an appropriate level of energy efficiency improvement. The base code (IECC) does clarify the need to meet current energy code requirements during roof replacements; however, the IgCC does not also require the additional 10% envelope improvement for such building renovations. The reference to Chapter 10 is necessary to clarify that roof replacements are not subject to the 10% envelope improvement of the IgCC.

GEW81-14

GEW83-14

605.3 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapprove

Committee Reason: The committee heard testimony that raised concerns regarding potential impacts to the roof structure, light reflected onto other buildings and lack of clear connection to the requirements in IECC. The committee felt that there was insufficient information provided regarding the energy savings this change would provide.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Amy Dickie, representing Global Cool Cities Alliance (amy@globalcoolcities.org) requests Approve as Submitted.

Commenter's Reason: Several new additional studies supporting the need for cool roofs in climate zone 4 have or will be published between the Memphis and Ft. Lauderdale hearings. The proponents will make this body of research available to the assembly, and we believe the entire assembly should have the opportunity to consider this issue at that time.

Public Comment 2:

Mike Fischer, representing The Roof Coatings Manufacturers Association and the Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com) request Disapprove.

Commenter's Reason: The proposal intends to extend cool roof requirements into Chapter 6, and into climate zone 4. The envelope energy efficiency requirements in the IgCC are based on an incremental increase of performance values (R-Value, U-Factor etc.) that is 10% higher than the IECC. Given the fact that there is no requirement for Climate Zone 4 in the base code, this proposal adds a much greater increase above the base code, and does so in areas of the country where the benefit of cool roofing is greatly reduced. The extension of cool roof requirements into Climate Zone 4 was disapproved in the 2015 IECC; it makes no sense to add it into the IgCC, especially at the proposed levels.

GEW83-14

GEW85-14

606.2.2.1, 606.2.2.2

Proposed Change as Submitted

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 OR GEOTHERMAL 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There is confusion regarding the terms, and the committee did not find that the change resolved the confusion. There was no testimony addressing the change to the values. There need to resolve that one term is renewable source, others are not and they are both in the same code provision. The committee encouraged the preparation of a public comment to update the table values.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 OR GEOTHERMAL HEAT PUMPS**

PRODUCT TYPE ^a	MINIMUM EER	MINIMUM COP	TEST PROCEDURE
Water-to-Air Closed loop	17.1	3.6	ISO 13256-1
Water-to-Air Open loop	21.1	4.1	ISO 13256-1
Water-to-Water Closed loop	16.1	3.1	ISO 13256-2
Water-to-Water Open loop	20.1	3.5	ISO 13256-2
Direct Expansion (DX) or Direct GeoExchange (DGX)	16.0	3.6	AHRI 870

a. Efficiency values apply to systems with a maximum rated cooling capacity of 65,000 Btu/hour.—

Commenter's Reason: This public comment would retain the addition of the term "geothermal heat pump" but would remove the under 65,000 btuh limitation that was contained in the original proposal.

By removing the 65,000 btuh limitation, the substantive provisions of the IGCC 2012 would remain identical.

With respect to the addition of the term "geothermal heat pump," this would help to avoid confusion in the marketplace. Both terms (ground source and geothermal) are used regularly but the term "geothermal heat pump" is used much more frequently. For instance, the U.S. Dept of Energy uses the term geothermal heat pump (<http://energy.gov/energysaver/articles/geothermal-heat-pumps>).

So does the U.S. EPA (http://www.energystar.gov/certified-products/detail/heat_pumps_geothermal)

So does Carrier (<http://www.carrier.com/homecomfort/en/us/products/heating-and-cooling/geothermal-heat-pumps/>)

So does Water Furnace (<http://www.waterfurnace.com/geothermal-heat-pumps.aspx>)

So does ClimateMaster (<http://www.climatemaster.com/residential/geothermal-heat-pumps/>)

So does GeoExchange (<http://www.geoexchange.org/>)

So does Florida Heat Pump (<http://www.fhp-mfg.com/>)

So does Trane (<http://www.trane.com/residential/products/geothermalsystems>)

As do lots of other folks (Vermont - <http://www.geoexchange.org/category/news/regional-news/vermont-news/>, Bryant - <http://www.bryant.com/products/geoheatpumps/>, This Old House - <http://www.thisoldhouse.com/toh/article/0,,20162296,00.html>, Maryland - http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MD21F, NYSERDA - <https://www.nyserdera.ny.gov/Energy-Efficiency-and-Renewable-Programs/Renewables/Geothermal-Heat-Pumps.aspx>, and many others)

Public Comment 2:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 OR GEOTHERMAL HEAT PUMPS**

PRODUCT TYPE ^a	MINIMUM EER	MINIMUM COP	TEST PROCEDURE
Water-to-Air Closed loop	17.1	3.6	ISO 13256-1
Water-to-Air Open loop	21.1	4.1	ISO 13256-1
Water-to-Water Closed loop	16.1	3.1	ISO 13256-2
Water-to-Water Open loop	20.1	3.5	ISO 13256-2
Direct Expansion (DX) or Direct GeoExchange (DGX)	16.0	3.6	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.

Commenter's Reason: This revision will result in the modification of table efficiency values to be up to date with current Energy Star values.

GEW85-14

GEW86-14

606.2.2.3

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee was concerned that this change in text in combination with changes to the IECC would result in there being no efficiency requirements for motors between 1 and 5 horsepower.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Amanda Hickman, representing AMCA International (amanda@intercodeinc.com) requests Approve as Submitted.

Commenter's Reason: AMCA International (AMCA) developed the concept of Fan Efficiency Grades (FEG) in response to direction from regulatory bodies and ASHRAE that fan efficiency requirements were needed in energy codes and standards. AMCA Standard 205, Energy Efficiency Classification for Fans, was initially published in 2010. The 2012 IgCC was the first model code to reference it for the first explicit fan efficiency requirement for commercial fans in a model standard.

Since that time, AMCA 205 was revised and accredited by ANSI in 2012, and referenced by ASHRAE 90.1 in 2013, and the 2015 IECC. An addendum to ASHRAE 189.1 toward the 2014 edition has passed public peer review and committee votes, and is awaiting final ballot by the ASHRAE Board of Directors.

The analyses that went into the codes and standards actions subsequent to the 2012 IgCC have led to provisions that better reflect the needs of the market. Therefore, AMCA encourages approval of GEW86 for the following reasons:

1. The proposal fixes the following problems with the existing language:

The existing language uses the term "peak total or static efficiency." The Fan Efficiency Grade metric is based on peak total efficiency, so having "static" in the provision is inconsistent with the definition of FEG and could cause confusion among designers and manufacturers and inconsistent enforcement.

2. The proposal will exempt safety fans and power roof ventilators (PRVs).

Safety fans and PRVs (low pressure centrifugal and axial roof and wall exhausters) are exempted from 90.1, 189.1, and the IECC. Fans that are run only during emergencies are exempted because they do not consume energy on a regular basis, and when they are run during emergencies, their efficiency is not a concern. PRVs are exempted because they consume only about 6% of the total connected fan load as they run at very low pressures. With such low pressure points of operation it is difficult to operate PRVs near a peak efficiency.

Please note that all PRVs utilize NEMA rated Energy Efficient Motors for all motors greater than or equal to 1 HP. Below 1 HP, an increasing number of PRVs are utilizing the ASHRAE code whereby they must use either an electronically controlled (EC) motor or a 70 percent efficient fractional motor.

3. The proposal harmonizes fan sizes with other codes and standards.

Re-setting the lowest range of covered fan sizes from > 1 HP to >5 HP harmonizes IgCC with IECC, and ASHRAE 90.1 and 189.1. Furthermore, fan efficiencies for smaller fans are inherently lower than larger fans of the same size, which is masked by FEG ratings. Therefore, the provision to increase to the large HP sizes will not decrease energy efficiency as much as it might seem. Based on 2012 fan sales data collected by AMCA from 21 member companies, which was constituted into a database containing more than 1.3 million fan sales records, the reduction in energy savings that this proposal amounts to is approximately 1.25%. This information was not available at the time of the Committee Action Hearing.

4. The proposal reduces fan energy consumption by approximately 10% over the 2015 IECC.

Please note that according to the database analysis mentioned above, the proposal will reduce fan energy consumption by approximately 10% over the 2015 IECC.

Public Comment 2:

Vickie Lovell, representing self (vickie@intercodeinc.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

606.2.2.3 Fan efficiency. ~~Fans shall~~ Fans over 1 hp shall comply with the provisions of Section C403.2.12.3 of the International Energy Conservation Code, provided that the total efficiency of the fan at the design point of operation shall be within 10 percentage points of the maximum total efficiency of the fan.

Commenter's Reason: AMCA International (AMCA) developed the concept of Fan Efficiency Grades (FEG) in response to direction from regulatory bodies and ASHRAE that fan efficiency requirements were needed in energy codes and standards. AMCA Standard 205, Energy Efficiency Classification for Fans, was initially published in 2010. The 2012 IgCC was the first model code to reference it for the first explicit fan efficiency requirement for commercial fans in a model standard.

Since that time, AMCA 205 was revised and accredited by ANSI in 2012, and referenced by ASHRAE 90.1 in 2013, and the 2015 IECC. An addendum to ASHRAE 189.1 toward the 2014 edition has passed public peer review and committee votes, and is awaiting final ballot by the ASHRAE Board of Directors.

The analyses that went into the codes and standards actions subsequent to the 2012 IgCC have led to provisions that better reflect the needs of the market. During the IgCC Committee Action Hearing, the panel expressed concern that the proposal would set the minimum fan size too high to have a material effect on reducing fan energy consumption. The proposal, therefore, has been modified to address this concern by keeping the lower fan size limit the same. That being said, other reasons for passing proposal GEW86 are as follows:

1. The proposal fixes the following problems with the existing language:

The existing language uses the term "peak total or static efficiency." The Fan Efficiency Grade metric is based on peak total efficiency, so having "static" in the provision is inconsistent with the definition of FEG and could cause confusion among designers and manufacturers and inconsistent enforcement.

2. The proposal will exempt safety fans and power roof ventilators (PRVs).

Safety fans and PRVs (low pressure centrifugal and axial roof and wall exhausters) are exempted from ASHRAE 90.1, 189.1, and the IECC. Fans that are run only during emergencies are exempted because they do not consume energy on a regular basis, and when they are run during emergencies, their efficiency is not a concern. PRVs are exempted because they consume only about 6% of the total connected fan load as they run at very low pressures. With such low pressure points of operation it is difficult to operate PRVs near a peak efficiency.

Please note that all PRVs utilize NEMA rated Energy Efficient Motors for all motors greater than or equal to 1 HP. Below 1 HP, an increasing number of PRVs are utilizing the ASHRAE code whereby they must use either an EC motor or a 70 percent efficient fractional motor.

3. The proposal saves 11% more than the 2015 IECC.

A 10% improvement in energy use results from the 10-point selection window (vs. 15 points away from peak total efficiency in the IECC). An additional 1.25% is available from the growth of coverage to motors greater than 1 HP, up to and including 5 HP.

GEW86-14

GEW87-14

606.2.2.4 (New), Table 606.2.2.4 (NEW), Chapter 12

Proposed Change as Submitted

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**

<u>Product Type</u>	<u>Minimum IPLV</u>	<u>Minimum COP</u>	<u>Test Procedure</u>
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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proponent identified that there were errors in the proposal which needed to be addressed during public comment.

Assembly Action:

None

Analysis: For staff Analysis: of the content of AHRI 560-00 relative to CP#28, Section 3.6, please visit:
<http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

**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	4.40 <u>1.11</u>	1.05	AHRI 560
Direct Fired, Double Effect	1.05	1.05	AHRI 560

Commenter's Reason: The revision has been made to the proposal.

GEW87-14

GEW94-14

606.8

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee was unsure of what final approved language contained in the IECC 2015 will be, therefore they felt this deletion to be premature.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

John Williams, representing Adhoc Health Care Committee (AHC@iccsafe.org) requests Approve as Modified by this public comment.

606.8 Laboratory exhaust systems. Laboratory exhaust systems shall comply with the provisions of Section C403.2.7 of the International Energy Conservation Code except as specified in Section 606.8.1.

Commenter's Reason: During the testimony it was stated that laboratory exhaust systems will be addressed in the 2015 IECC. While there isn't a specific section regarding laboratory exhaust systems in the IECC, there provisions which address laboratory fume hoods. Section C403.2.7 requires energy recovery ventilation systems. The section provisions an exception for laboratory fume hood systems meeting certain criteria. These criteria need to be considered in conjunction with the provisions of 606.8 and 606.8.1 when the IgCC is adopted. Rather than our original proposal of striking very generic reference to the IECC, we think it is important to have a specific reference since the requirement is 'hidden' in an exception.

GEW94-14

GEW98-14

607.5, A106.3.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Based on the Committee's approved as modified action on GEW101-14, the Committee determined that approval of this proposal was unnecessary.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

John Williams, representing Adhoc Health Care Committee (AHC@iccsafe.org) requests Approve as Submitted.

Commenter's Reason: The development committee disapproved this change believing it was resolved by the action on GEW101-14. However, only half of this change was resolved.

Section 607.5 has been entirely replaced by GEW101-14. The modification deleted the Group I-2 list from that proposal. Therefore the issue with Section 607.5 is resolved if GEW101-14 remains approved as submitted.

The change to A106.3.2 is editorial. Group I-2 includes all these types of facilities. Putting in the list here implies that there are some Group I-2 types of facilities that would not be covered.

GEW98-14

GEW114-14

608.2, 608.2.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The change provides consistency between the text of the IECC revised provisions and the IgCC. The IgCC provisions are retained because they are more stringent than the IECC. There was a suggestion that the text be revised to say 'master control device or system', in that the installation may be more than a single device. The committee suggested the revision be considered during public comment when it can be better ascertained with the added text was also in the IECC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Marilyn Williams, representing National Electrical Manufacturers Association (mar_williams@nema.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

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 sensor controls that require manual intervention to energize circuits.

Exception: 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 or system for the sleeping unit.

Commenter's Reason: The committee was in error in approving this proposal without consideration of the floor modification that was proposed. The floor modification had the endorsement of the proposal's proponent. The committee's rationale for not approving the floor modification was that did not maintain consistency with the IECC. It is respectfully submitted that the IECC is deficient in using only the term "device" to satisfy this requirement because it implies that only one device can be utilized, when in actuality it requires a system to comply. Just because the IECC has it wrong, does not mean it should be propagated into this code, thusly making the IgCC un-enforceable. The committee's approved language will make the enforcement of this code very difficult because the requirement cannot be satisfied with a single device. A system is required in order to comply with this requirement. It is respectfully requested that the members make their lives less complicated by approving this public comment.

Public Comment 2:

Marilyn Williams, representing National Electrical Manufacturers Association (mar_williams@nema.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

608.2 Sleeping unit controls. Sleeping units in Group R-1 and R-2 occupancies shall have a master control device or system that is capable of automatically switching off all installed luminaires and switched receptacles within 20 minutes after all occupants have left the room.

Exception: Luminaires and switched receptacles controlled by captive key controls.

Commenter's Reason: The committee was in error in approving this proposal without consideration of the floor modification that was proposed. The floor modification had the endorsement of the proposal's proponent. The committee's rationale for not approving the floor modification was that did not maintain consistency with the IECC. It is respectfully submitted that the IECC is deficient in using only the term "device" to satisfy this requirement because it implies that only one device can be utilized, when in actuality it requires a system to comply. Just because the IECC has it wrong, does not mean it should be propagated into this code, thusly making the IgCC un-enforceable. The committee's approved language will make the enforcement of this code very difficult because the requirement cannot be satisfied with a single device. A system is required in order to comply with this requirement. It is respectfully requested that the members make their lives less complicated by approving this public comment

Public Comment 3:

Wayne Stoppelmoor, representing Schneider Electric (wayne.stoppelmoor@schneider-electric.com) requests Disapprove.

Commenter's Reason: The committee was in error in approving this proposal without consideration of the floor modification that was proposed. The committee's approved language will make the enforcement of this code very difficult because the requirement cannot be satisfied with a single device. It is respectfully submitted that the language existing in the code is better than the proposed language and this proposal be disapproved.

GEW114-14

GEW119-14

608.7

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that the use of gas lights was not always restricted to 'process' loads. A growing use of such lighting is anticipated.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Neil Leslie, representing self (neil.leslie@gastechnology.org) requests Approve as Submitted.

Commenter's Reason: Gas lights are decorative appliances that provide ambiance for specific applications. They are not intended to meet space lighting needs. The provision creates strong disincentive for the installation of gas lights that have unique value in some building types such as restaurants. The proposed change would remove that disincentive and provide more equitable treatment of this decorative appliance option.

GEW119-14

GEW120-14

608.7

Proposed Change as Submitted

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

Public Hearing Results

Committee Action: Disapproved

Committee Reason: The committee considered the change to be an undesirable change to the scope of the code.

Assembly Action: None

Individual Consideration Agenda

Public Comment:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Submitted.

Commenter's Reason: This language will close a loophole for these types of products, and ensure that all types of lighting energy are accounted for.

GEW120-14

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,

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal is incomplete. There needs to be some collaborative work with the proponents of GEW133 and return to public comment hearing with better proposal. Exception 1 to Section 610.3 is unclear and may result in double counting. The proposal wouldn't apply to buildings which don't use electricity, and therefore would not be required to address renewables.

Assembly Motion:

None

Individual Consideration Agenda

Public Comment:

Craig Conner, representing self (craig.conner@mac.com); Gary Klein, Affiliated International Management, LLC, representing self (gary@aim4sustainability.com), request Approve as Modified by this Public Comment.

Modify the proposal as follows:

610.3 Alternative sources The Either of the following shall be considered as substitutes for any portion of the renewable energy requirement of compliance with Section 610.1:

1. Conserving additional non-renewable energy, where equal to at least 4 percent of the conserved non-renewable estimated annual energy equals twice the renewable energy credited use for heating, cooling, ventilation, lighting and service water heating; or.
2. Renewable Purchasing renewable energy credits (RECs) or local utility green power is purchased, where the purchased amount equals ten times the renewable equal to at least 20 percent of one year's estimated energy credited. Documentation of the purchase shall be provided. use for heating, cooling, ventilation, lighting and service water heating.

Commenter's Reason: This clarifies Section 610.3 on alternatives to onsite renewable energy systems. Many buildings are located such that renewable energy systems on the building or site are difficult or impractical, often because of the shading that blocks some or all of the sun. Therefore it is important that alternatives be clear.

Approval of this comment will mean a much more understandable section on renewables. The result of this comment would be the code section below. Note how much shorter and more understandable this is when compared to the existing IGCC Section 610.

610 RENEWABLE ENERGY SYSTEMS

610.1 Renewable energy requirements. 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.

610.2 Building averaging. The required renewable energy shall be computed for each building or for a group of buildings.

610.3. Alternative sources. Either of the following shall be considered compliance with Section 610.1:

1. Conserving additional non-renewable energy equal to at least 4% of the estimated annual energy use for heating, cooling, ventilation, lighting, and service water heating; or
2. Purchasing renewable energy credits (RECs) or local utility green power equal to at least 20% of one year's estimated energy use for heating, cooling, ventilation, lighting, and service water heating.

610.4 Prescriptive compliance. 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 System requirements. 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.

610.6 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.

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). A REC represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. A REC is sold separately from the electricity associated with a renewable energy source.

RENEWABLE ENERGY SOURCE. Energy derived from solar radiation, wind, waves, tides, biogas, biomass, or geothermal energy.

GEW132-14

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

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee acknowledged that the provisions of Section 610 need improvement. GEW133 had more committee members feel that it provided the better foundation for the next code. The committee hopes that this proponent will work

with the proponents of the related proposals to provide through the public comment process a comprehensive revision to the section. Of concern are provisions which would place the local code official in the middle of contractual relationships between a building owner and the seller of renewable energy credits. There needs to be more information provided regarding the change in the power units. The terms 'demand' and 'power use' seem to be used interchangeably when they are distinct terms.

Assembly Motion:
Online Vote Results:
Assembly Action:

Approve as Submitted
Failed - Support: 37.01% (57) Oppose: 62.99% (97)
None

Individual Consideration Agenda

Public Comment:

Lorraine Ross, representing Intech Consulting Inc for The Dow Chemical Company (Intech@tampabay.rr.com) requests Approve as Modified by this Public Comment.

Replace the proposal as follows:

SECTION 202 DEFINITIONS

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 A REC represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. An A REC, and its associated attributes and benefits, is sold separately from the underlying physical electricity associated with an on-site 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.

202 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.

SECTION 610 BUILDING RENEWABLE ENERGY SYSTEMS

SECTION 610 ONSITE RENEWABLE ENERGY SYSTEMS

610.1 Onsite renewable energy systems. Each building or its associated building site shall be equipped with any combination of onsite renewable energy systems in accordance with one of the following:

1. Provide not less than 0.50 watts per square foot (5.4 W/m²) of conditioned floor area of the building.
2. Provide not less than 3 percent of the energy used within the building for building mechanical and service water heating equipment and lighting regulated in Chapter 4 of the *International Energy Conservation Code*.

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. Onsite renewable energy systems shall be tested after installation to verify that the installed performance meets design specifications. A report of the tested performance shall be provided to the building owner and the building official. Onsite renewable energy systems shall be individually metered in accordance with Section 603.3.7

Exceptions:

1. For buildings where the registered design professional certifies that the incident solar radiation available to the building or its associated building site is not sufficient to meet the requirements of Section 610.1 and where the owner shall contract for no less than 87 kWh Renewable Energy Credits per square foot of conditioned floor area. The Renewable Energy Credits shall comply with Section 610.2.2
2. Building occupancies listed below, where at least 10 percent of the building's total annual estimated hot water consumption is met with any combination of onsite renewable energy systems designed, constructed and installed in accordance with manufacturer's instructions.
 - 2.1 Group A-2, restaurants and banquet halls
 - 2.2 Group F, laundries
 - 2.3 Group R-1, boarding houses, hotels, motels

- 2.4 Group R-2 occupancies
- 2.5 Group A-3, health clubs and spas
- 2.6 Group I-2, hospitals, psychiatric hospitals and nursing homes
- 3. Buildings where at least 10 percent of the buildings total annual estimated space heating or space cooling is met by any combination of onsite renewable energy systems designed constructed and installed in accordance with manufacturer's instructions.

610.2 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.

Commenter's Reason: As stated in the 2014 Report of the Committee Action Hearings Results, "The committee acknowledged that the provisions of Section 610 need improvement. GEW 133 had more committee members (lost by only 1 vote) feel that it provided the better foundation for the next code."

This Public Comment reflects a comprehensive revision to the section, largely based on committee comments, stakeholder testimony and newly approved and published 2015 code revisions for building, energy, 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, in order to assure maximum flexibility and design choice, three exceptions are granted, including the use of Renewable Energy Credits (RECS) as an alternate method to meet the onsite renewable energy system requirement under certain specific building and associated site 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, either on the building or on its associated building site. Either a prescriptive or performance approach to compliance is shown. The values for each are taken directly from 2015 IECC Section C406.5 and addresses regulated loads.

The detailed installation, fire, structural, electrical, and other requirements for these systems are now very clearly defined in the 2015 IBC, 2015 IFC, and NFPA 70. System performance verification and metering language is consolidated and is unchanged from 2012 IgCC (Sections 610.2.2.1 Performance verification and Section 610.5.1 Metering.)

Exceptions:

The existing exceptions were radically rewritten based on committee comments and stakeholders testimony.

Exception 1 - recognizes that there are conditions, such as building orientation, limited roof area, other adjacent existing buildings or site vegetation or topography, where the onsite renewable energy system alone cannot provide the minimum energy required in Section 610.1. In this case, the entire requirement in this section can be met by RECS alone. To comply with this exception, the registered design professional shall certify that this condition exists AND the building owner shall commit to secure Renewable Energy Credits that provide 87 kWh per square foot of conditioned floor area. The 87 kWh per square foot of conditioned floor area value matches the prescriptive requirement of 0.50 watts per square foot found in Section 610.1 Item 1.

Exception 2 – granted to certain occupancies where there is a high volume of hot water consumption. In these cases, compliance with this section is demonstrated by supplying 10% of the hot water needs in these buildings with ANY COMBINATION of onsite renewable energy systems. This change is in response to various stakeholders' testimony that correctly noted that flexibility in selection of the type of onsite renewable energy systems is desirable in the IgCC.

Exception 4 - granted to buildings where ANY COMBINATION of onsite renewable energy systems provide at least 10% of the buildings space heating or space cooling. As with Exception 2, this change is in response to various stakeholders' testimony that correctly noted that flexibility in selection of the type of onsite renewable energy systems is desirable in the IgCC.

Section 610.2

This section outlines criteria for Renewable Energy Credits. It was widely recognized by the committee in discussion of GEW 137 that additional definition of RECs was needed to be able to determine which RECs were acceptable to meet the requirements of the code.

The precedent for using RECs as an alternative to onsite renewable energy systems was set by ASHRAE 189.1. ASHRAE 189.1-2011 references the "Green-E" standard to ensure the acceptability of the RECs used for compliance with the Standard. However, because Green-E is not ANSI certified, it cannot be cited in the IgCC. For this reason, GEW137-14 was written as a

means to provide the critical criteria in the IgCC by which the acceptability of RECs can be evaluated. As was noted by the Committee, this additional "definition" is needed in the IgCC to provide guidance for users, code officials, and RECs providers.

"Renewable Energy Credit" is defined in the code; however, that definition is conceptual. It does not reflect a market where the quality and attributes of RECs can vary drastically. The set of qualifying requirements in GEW 137 ensures that RECs used in the IgCC meet a minimum level of quality. They ensure that the environmental benefits of the REC can be attributed to the IgCC project, and the IgCC project alone, with no "double-dipping." If the environmental benefit of the REC is claimed elsewhere, or mandated by another regulation, then there is no environmental benefit remaining to meet the IgCC requirement. Energy codes do not allow the insulation installed in other buildings to be used to meet code requirements in the subject project. The code should not allow RECs "installed" elsewhere to be used to meet IgCC requirements. The set of qualifiers in GEW137 is needed to ensure this because the both the unregulated RECs market and the current IgCC definition do not.

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.

GEW133-14

GEW134-14

610.1, 610.1.1, 610.1.2, 610.4

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee did not see that this proposal provided any improvement to the section. It also places the code official in a position over monitoring a post Certificate of Occupancy contract which most local agencies will not want to be involved.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 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 5 percent of the total annual building energy consumption from renewable generation takes the form of a 40 ~~5~~-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 5 percent of the total annual building energy consumption from renewable generation.

610.4 Solar water heating equipment. Not less than 20 ~~15~~ percent of the building's annual estimated hot water energy usage shall be supplied by onsite solar water heating equipment.

Commenter's Reason: The modifications will be in line with the intent of the proposal on the term of RECs and increasing the requirements in this section.

GEW134-14

GEW135-14

610.2, 610.3, 610.5.1, 610.5.2

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal revises text which implies in some sections that only electric energy is being addressed versus a variety of fuels discussed in other sections. The proposal also improves the clarity of the metering and monitoring requirements

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

ME Krebs, representing Laclede Gas (mkrebs@lacledegas.com) requests Disapprove.

Commenter's Reason: Despite its appearances, GEW 135-14 is biased against non-electric energy sources by requiring more renewables for buildings that use energy forms other than electricity (e.g., natural gas). As such, it will significantly increase construction costs of multi-fueled buildings OR assure that such buildings are electric only. Therefore, Mr. Foster's proposal GEW 135-14 should be disapproved.

GEW135-14

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)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The text of the proposal would require that the 'fuel' for these alternative energy sources be derived on the site. For some of these not enough 'fuel' would be generated on a single site to make the recovery of the energy practical.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Submitted.

Commenter's Reason: The original proponents reason is persuasive; namely that the IGCC allows the use of biomass and biogas to meet renewable energy requirements but there are no guidelines on their respective calculation.

As submitted, this proposal would give guidance to users interested in biogas and biomass.

Public Comment 2:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

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.

610.6.2 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.

Commenter's Reason: The proposed modifications will allow the use of alternative energy sources that are not produced on-site..

GEW136-14

GEW137-14

610.1.1 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee felt that as the Renewable Energy Credit (REC) are already in the code, they need to be 'defined' carefully. The proposal provides a clear set of standards by which to judge the acceptability of RECs.

Assembly Motion:

Disapprove

Online Vote Results:

Successful - Support: 54.19% (84) Oppose: 45.81% (71)

Assembly Action:

Disapproved

Individual Consideration Agenda

Public Comment 1:

Jim Edelson, representing New buildings Institute requests Approve as Submitted.

Commenter's Reason: The Memphis Committee approved GEW137-14 with an 11-2 vote. It was widely recognized that additional definition of RECs was needed to be able to determine which RECs were acceptable to meet the requirements of the code.

The precedent for using RECs as an alternative to onsite renewable energy systems was set by ASHRAE 189.1. ASHRAE 189.1-2011 cites to the "Green-E" standard to ensure the acceptability of the RECs used for compliance with the Standard. However, because Green-E is not ANSI certified, it cannot be cited in the IgCC. For this reason, GEW137-14 was written as a means to provide the critical criteria in the IgCC by which the acceptability of RECs can be evaluated. As was noted by the Committee, this additional "definition" is needed in the IgCC to provide guidance for users, code officials, and RECs providers.

"Renewable Energy Credit" is defined in the code; however, that definition is conceptual. It does not reflect a market where the quality and attributes of RECs can vary drastically. The set of qualifying requirements in GEW 137 ensures that RECs used in the IgCC meet a minimum level of quality. They ensure that the environmental benefits of the REC can be attributed to the IgCC project, and the IgCC project alone, with no "double-dipping." If the environmental benefit of the REC is claimed elsewhere, or mandated by another regulation, then there is no environmental benefit remaining to meet the IgCC requirement. Energy codes do not allow the insulation installed in other buildings to be used to meet code requirements in the subject project. The code should not allow RECs "installed" elsewhere to be used to meet IgCC requirements. The set of qualifiers in GEW137 is needed to ensure this because the both the unregulated RECs market and the current IgCC definition do not.

Public Comment 2:

Assembly Action requests Disapprove.

Commenter's Reason: This code change proposal is on the agenda for individual consideration because the proposal received a successful assembly action. The assembly action for Disapprove was successful by a vote of 54.19% (84) to 45.81% (71) by eligible members online during the period fo May 19 - May 30, 2014.

Public Comment 3:

Craig Conner, representing self (craig.conner@mac.com); Hope Medina (hmedina@coloradocode.net) requests Disapprove.

Commenter's Reason: This change limits REC sales from renewables to 15 years (if not repowered). Most renewables last longer than 15 years, sometimes much longer. Wind turbines last 15 to 30 years. Utility scale photovoltaic (PV) may have a 25 to 30 year life. Hydro dams and geothermal facilities have much long useful lifetimes.

The proposed 15-year limit reduces the value and financial viability of new renewable projects. Why would the IGCC want to undercut the value of new renewable projects?

Preventing double counting is one reason for this change. REC tracking programs already watch for double counting by selling the same thing twice. Neither the IGCC nor the code official should try to regulate the RECs market.

Public Comment 4:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Disapprove.

Commenter's Reason: The proponent's intentions were good in this proposal but, as written, it is problematic.

REC's are a creation of state statutes. There are no federal REC's. This means that what qualifies for a REC in one state may or may not qualify in another. For instance, electricity from incinerated waste is a REC in Maryland but not in New Jersey, Washington, DC or Delaware.

As another example, Pennsylvania defines coal mine methane as renewable. No other states do. Maryland allows poultry litter incineration as a REC but not other states.

Each state has its own rules for the definition of renewable energy credits and this proposal would pit the IGCC against the states.

The IGCC's definition of REC's should defer to the definition of REC's in the state where a building is sited.

Please disapprove this proposal.

See attachment.

Public Comment 5:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Disapprove.

Commenter's Reason: The intent of the proposal is understandable, but there are many enforcement issues with the language.

-How is a code official supposed to determine the age of the off-site renewable generation facility or facilities? What if some of the facilities are over 15 years old, and the others are newer?

-There is language about "where required under any legal requirement". That language is vague, and could be interpreted to cover a contract between a building owner and developer who have signed a legal requirement for the use of RECs.

-What if a state or locality allows RECs to be used to meet local or state renewable energy requirements? This language could contradict state or local laws, leaving the code official in an enforcement bind.

GEW137-14

GEW139-14

610.4, Chapter 12

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee was concerned that the provisions conflicted or at the very least overlapped with requirements of the IMC. This is proposed to the wrong code.

Assembly Action:

None

Analysis:: For staff Analysis: of the content of SRCC 300-2013-09 Minimum Standards for Solar Water Heating Systems relative to CP#28, Section 3.6, please visit: <http://www.iccsafe.org/cs/codes/Documents/2012-2014Cycle/ProposedStandards-042314.pdf>

Individual Consideration Agenda

Public Comment:

Jim Huggins, Solar Rating & Certification Corp., representing SRCC (jhuggins@solar-rating.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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 the International Mechanical Code and 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.

Commenter's Reason: A new standard on solar thermal systems is being developed by ICC. This standard is based on and expands beyond SRCC Standard 300. The new ICC standard is currently out for public comment (<http://www.iccsafe.org/cs/standards/IS-STSC/Pages/default.aspx>). During next review cycle for the IMC, proposals will be submitted to update it to reference this new ICC standard. SRCC Standard 300 is already referenced in the 2015 IRC. The IRC reference will be updated to the new ICC standard during the next IRC review cycle. Inclusion of a reference to SRCC Standard 300 in the IgCC during this code cycle will facilitate conversion to the ICC version of the solar thermal systems standard during the next review cycle. Meanwhile, users of the IgCC can benefit from the expanded coverage found in SRCC Standard 300 compared to Chapter 14 of the IMC. Most of the items in Chapter 14 of the IMC are also addressed in SRCC Standard 300, along with many more issues of concern in solar thermal systems. Finally, since this paragraph of the IgCC requires estimation of the annual energy supplied by onsite solar water heating equipment, inclusion of guidance on how to do this estimation is appropriate for inclusion here.

GEW139-14

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee was somewhat receptive to the concept but felt the proposal would work better as an exception to the general rule. Among the concerns was the possibility that the 'actively' monitored system wasn't monitoring all those things for which commissioning is required. There also needs to be more clarity as to what 'actively monitored' means.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Barry Greive, representing Target Corporation (barry.greive@target.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

611.1.5.5 Post-occupancy recommissioning. ~~Where there is not an actively monitored and managed energy management and control system, the~~ 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.

Exception: Buildings monitored by an energy management and control system.

Commenter's Reason: Many buildings have an energy management and control system (EMCS) which means that the system is essentially being commissioned on a daily basis. With these types of systems there is no reason to have a commissioning company repeat this work. If a report is required by the Code Official the owner needs to provide a report on the EMCS system and how the components are functioning.

Public Comment 2:

Steven Rosenstock, Edison Electric Institute, representing self (srosenstock@eei.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

611.1.5.5 Post-occupancy recommissioning. Where there is not an actively monitored and managed energy management and control system that can provide post-occupancy commissioning reports, 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.

Commenter's Reason: The modification provides clarification so that multi-site customers with sophisticated building and energy management systems can more easily comply with this section.

GEW145-14

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)

Proposed Change as Submitted

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 (EUI_r)

<u>Climate zone^a</u>	<u>1A</u>	<u>2A</u>	<u>2B</u>	<u>3A</u>	<u>3B</u>	<u>3C</u>	<u>4A</u>	<u>4B</u>	<u>4C</u>	<u>5A</u>	<u>5B</u>	<u>6A</u>	<u>6B</u>	<u>7</u>	<u>8</u>
<u>Use and Occupancy^b</u>	Reference EUI _r skBtu/sf/yr														
<u>Business (B)</u>															
<u>Office</u>	154	159	154	151	140	137	167	144	152	179	155	190	176	208	282

Climate zone^a	1A	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	6A	6B	7	8
Bank	154	159	154	151	140	137	167	144	152	179	155	190	176	208	282
Medical office (non-diagnostic)	115	118	115	113	104	102	125	108	114	134	116	148	131	156	210
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.

$$zEPI = 100 (EUI_a / EUI_r) \quad \text{(Equation 6-3)}$$

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 (EUI_a). The actual energy use intensity (EUI_a) 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 EUI_a.

The EUI_a shall be determined in accordance with Equation 6-4 and Sections 612.1.2.1.

$$EUI_a = (AEU_{\text{consumption}} - AEU_{\text{renewable}}) / TCFA \quad \text{(Equation 6-4)}$$

Where:

EUI_a = the energy use intensity of the *building* and *building site*

$AEU_{\text{consumption}}$ = 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. The AEU 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.

CO₂ea ≤ (CO₂er x zEPI) / 100 (Equation 6-5)

where:

zEPI = the minimum score as prescribed by Section 612.1.1

CO₂ea = emissions associated with the EUIa of the building as determined in accordance with Section 612.1.2

CO₂er = 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.

612.2.2 Onsite nonrenewable energy. For the purpose of determining compliance with the provisions of Section 612.2, the CO₂e emissions associated with onsite non-renewable energy use shall be calculated in accordance with Section 602.2.2.

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

Public Hearing Results

The following errata is not posted to the ICC website.

612.1.3 Reference energy use intensity (EUI_r). The reference energy use intensity shall be determined utilizing Table 612.1. The EUI_r value from Table 603.4 **612.1** 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 Section 612.3.2. For buildings with multiple use or occupancy designations in Table 612.1, the EUI_r shall be adjusted based on the weighted area average of the use or occupancy.

~~**603.2.2**~~ **612.2.2 Onsite nonrenewable energy.** For the purpose of determining compliance with the provisions of Section 612.2 the CO₂e emissions associated with onsite non-renewable energy use shall be calculated in accordance with Section 602.2.2.

(The errata been incorporated into cdpACCESS.)

Committee Action:**Approved as Modified****Modify the proposal as follows:****612.2 Annual direct and indirect CO₂e emissions.**

CO₂er = emissions associated with the EUIr as determined in accordance with Section 612.1.3 utilizing the same mix of specific energy types used by the actual building in calculation of CO₂ea.

~~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.~~

(Portions of the proposal not shown remain unmodified.)

Committee Reason: The proposal is an important step forward in how the energy efficiency of buildings are evaluated and measured. Our existing paths are flawed. The prescriptive path can be too restrictive; the performance path is not actually predicting the expected energy use of the completed building. This method, as another option for compliance, establishes a target for energy use and evaluates the completed building against the target. It makes the building owner a part of the 'team' who must make a commitment to operate the building within the parameters of the approved and completed. Designers who participate in this option approach can manage their risk through their contract.

The amendment clarifies how the CO₂er is calculated.

The proposal needs further refinement. At this time, some committee members felt that the best solution may be to place this in the code as a new appendix. There was some discomfort with using a model set in 2000 data, can something more recent be employed. The Analysis: period of 12 months can be cherry picked out the 36 month period. There is concern a design professional will be held responsible for non-compliance where the designer has not control over what the building owner does in the building for those 36 months. There also seems no control of how tenant spaces are filled out; and if those are or are not within the control of the code official. What is the result of non-compliance? There is discomfort with holding a Certificate of Occupancy hostage for 3 years. Finally there remains concern of trying to impose a 36 observation period on the local code officials.

Assembly Action:**None****Individual Consideration Agenda****Public Comment 1:**

Ryan Colker, representing National Institute of Building Sciences (rcolker@nibs.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

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.

$$\text{CO}_2\text{ea} \leq (\text{CO}_2\text{er} \times \text{zEPI}) / 100 \quad \text{(Equation 6-5)}$$

where:

zEPI = the minimum score as prescribed by Section 612.1.1

CO₂ea = emissions associated with the EUIa of the building as determined in accordance with Section 612.1.2

CO₂er = emissions associated with the EUIr as determined in accordance with Section 612.1.3 utilizing where the EUIr is apportioned with the same mix distribution of specific energy fuel types used by as measured in the actual building in calculation of CO₂ea EUIa.

Commenter's Reason: As indicated by the committee upon initial approval of the underlying proposal, "This proposal is an important step forward in how the energy efficiency of buildings are evaluated and measured. Our existing paths have inherent limitations when seeking the higher levels of performance required by modern codes, especially the IgCC. The prescriptive path can be too restrictive; the performance path is not actually predicting the expected energy use of the completed building. This method, as another option for compliance, establishes a target for energy use and evaluates the completed building against the target. It makes the building owner part of the 'team' and [they] make a commitment to operate the building within the parameters of the approved. Designers who participate in this option approach can manage their risk through their contract."

Through this public comment, the proponent and supporting organizations address the concerns raised by the committee. The EUIr values present in Table 612.1 which serve as the basis of the outcome targets are based on the data from the 2003 Commercial Building Energy Consumption Survey (CBECS). CBECS is conducted by the U.S. Department of Energy's Energy Information Administration. It is the most comprehensive and statistically accurate assessment of the nation's building stock. It is widely recognized across the industry and is utilized as the underlying data for numerous programs including the EPA Energy Star Program, the USGBC's LEED program, GBI's Green Globes, and ASHRAE's Building Energy Quotient (bEQ). Within the IgCC, the 2003 CBECS data serves as the baseline for determination of the zEPI. Therefore, the use of 2003 CBECS data under this proposal provides consistency with the rest of the code.

This comment provides clearer language regarding the calculation of the CO₂e to assure that the methodology provides a meaningful relationship between the energy calculations and the calculation of CO₂e emissions.

This proposal recognizes the fact that many jurisdictions do not have the personnel or fiscal resources to adequately ensure compliance with energy and sustainability requirements. By focusing on the outcome, code officials and communities can be assured that requirements are being met while not incurring additional enforcement burdens. If an owner and design team elect to pursue this path, they ultimately bear the burden of demonstrating compliance and achievement of the outcome.

Many communities have begun development and implementation of programs to reduce energy use or greenhouse gas emissions across multiple sectors—including buildings. The establishment of benchmarking and reporting requirements, 2030 Districts and goals for zero energy buildings are based on the achievement of actual energy savings, not theoretical results. Providing a pathway within code to focus on actual energy use can help communities drive achievement of energy and greenhouse gas emission goals.

This additional option for compliance with the energy provisions of the IgCC provides a framework for leading communities, code departments, building owners and design teams to realize actual energy use results.

Public Comment 2:

**Hope Medina, representing Colorado Chapter of International Code Council
(hmedina@coloradocode.net) requests Approve as Modified by this Public Comment.**

Modify the proposal as follows:

SECTION 202 DEFINITIONS

POST OCCUPANCY VERIFICATION PERMIT. A permit issued before a certificate of occupancy requirements of this code that occur post occupancy.

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.

Exception: Where the code official has issued a post occupancy verification permit in accordance with Section 612.3.3, the code official shall issue a Certificate of Occupancy.

612.3.3 Post occupancy verification permit Within 36 months of issuance of a post occupancy verification permit, 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 during which the building complied with Sections 612.1 and 612.2. The documentation shall include occupancy or use type for the occupied period, the beginning and ending dates of the 12-month period, and the total conditioned floor area of the building. The post occupancy verification permit shall remain in effect until the code official has received the documentation verifying compliance with Sections 612.1 and 612.2.

Commenter's Reason: Alterations to section 612.3 address the concerns expressed by a few jurisdictions where temporary certificates of occupancy may not be issued until the project is in full compliance. This public comment would allow jurisdictions the option to issue a Post Occupancy Verification Permit (POVP) to serve as the method for addressing compliance with post-occupancy requirements. Like the Temporary Certificate of Occupancy, the post Occupancy Verification Permit would place the burden on the building owner or representative to satisfy the conditions of the TCO or POVP. We recognize and want to address the committee's concern over "holding a Certificate of Occupancy hostage for 3 years" this public comment provides solutions for their concerns. As a reminder the owner or owner's representative has chosen this compliance path fully aware that it involves 12 consecutive months of compliance post occupancy. This comment allows for the owner to secure it's financing while still allowing the code official flexibility to enforce post occupancy issues. The establishment of a POVP is a new concept for everyone involved, and is outside the box of "normal" code enforcement. We have come to a juncture with code compliance where more requirements are being required post occupancy, and we must provide a solution for this. The POVP is the framework for a possible solution for code officials to handle these provisions in a fashion that does not impede development for their jurisdiction.

Public Comment 3:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Disapprove.

Commenter's Reason: The IGCC has had difficulty achieving adoption by jurisdictions and, if approved, this proposal will only add to those problems.

By the Committee's own words, this "proposal needs further refinement.." Firstly, it is based on a 14 year old data set. Next, it imposes a continuing obligation on code officials for 3 years after a COO is issued!

The use of source energy brings its own set of problems as does the lack of flexibility in choosing the building type.

There are many problems with this proposal.

Please disapprove it for this code cycle.

Public Comment 4:

Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests Disapprove.

Commenter's Reason: There are many problems with this proposal.

-The use of CBECS 2003 data means that the compliance is based on comparing a green building to all buildings built at least 14 years ago. The CBECS data set contains energy usage for buildings that were built in the early 1900's through the year 2003. The average / median age of a building in the CBECS data set is about 40-45 years old. It is not clear if the values in the table are using numbers for buildings built between 2000 and 2003, or for all buildings in the database.

-The use of source energy will lead to game playing and possible fuel switching, as different types of fuel have different source energy estimates associated with them. Also, it is not clear if the "source" estimates in the table are based on recent source estimates or for source estimates for some or all of the years between 1903 and 2003. In addition, building owners only receive site energy information on their energy bills, and the use of source estimates produced in different years leads to variable outputs.

-Proposed Equation 6-4 mixes on-site renewable energy production with energy end-use intensity. Producing energy on-site does not make a building more efficient (in nearly all cases), and distorts any comparisons with buildings that do not have renewable energy production facilities on-site. This equation allows less efficient buildings with on-site production to be "compliant" with this option, as long as the EUIa value is less than shown in the table.

-The table is incomplete. The following facility types are not shown in the table, and could not use this option: Retail stores, Restaurants (fast food or full service), Religious Worship, Theaters, High Schools, Colleges, Hotels, Motels, and Data Centers. Therefore, it is not a full compliance option for many types of commercial buildings.

In addition, the committee provided several reasons why this proposal should not be approved:

"The proposal needs further refinement. At this time, some committee members felt that the best solution may be to place this in the code as a new appendix. There was some discomfort with using a model set in 2000 data, can something more recent be employed. The analysis period of 12 months can be cherry picked out the 36 month period. There is concern a design professional will be held responsible for non-compliance where the designer has not control over what the building owner does in the building for those 36 months. There also seems no control of how tenant spaces are filled out; and if those are or are not within the control of the code official. What is the result of non-compliance? There is discomfort with holding a Certificate of Occupancy hostage for 3 years. Finally there remains concern of trying to impose a 36month observation period on the local code officials." (emphasis added)

GEW147-14

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Given that this code encourages the use of nonpotable water sources, providing for safe water consumption needs to be a part of the scope of the IgCC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

David Collins, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com) requests Approve as Submitted.

Commenter's Reason: The AIA supports the approval of GEW148 as originally submitted. This proposal deletes the requirement for "safe water consumption" since it is not possible to ensure this given the myriad scenarios and occupant behavior that could occur after the water is supplied. Section 102 already states that, as an overlay code, the IgCC and its provisions shall not be deemed to nullify any provision of law that prohibits the provision of unsafe water. The intent of this section of the IgCC is to address water resource quality and conservation. Any different intent for this clause would call for a separate, appropriate revision.

We urge the membership to vote to approve this change as submitted..

GEW148-14

GEW149-14

702.1

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposed changes are safety related items that are better suited to be proposed to the IPC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

David Collins, The Preview Group, Inc., representing The American Institute of Architects (dcollins@preview-group.com) requests Approve as Submitted.

Commenter's Reason: The AIA supports GEW149 as originally submitted. 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. The original proponent of GEW149, Karen Hobbs representing the Natural Resources Defense Council, cited in her reason statement several studies testing combinations of valves and shower heads to determine whether pressure-compensating valves and thermostatic valves rated for 2.5 gpm would perform adequately at lower flow rates. The results indicated that a significant share of shower valves rated for 2.5 gpm failed to provide the scald protection specified when tested at lower flow rates.

To help ensure that new buildings built to the IgCC can safely accommodate showerheads with this flow rate, GEW149 modifies Section 702.1 to require pressure balance tempering valve on showers to operate at the reduced flow rates of the 2.0 gpm maximum allowed under the IgCC. It includes a marking requirement that is necessary to facilitate inspection and compliance and will provide a point of reference for building occupants to consider when changing showerheads in the future.

We ask the membership to approve this change as submitted.

Public Comment 2:

Karen Hobbs, representing Natural Resources Defense Council (khobbs@nrdc.org) requests Approve as Submitted.

Modify the proposal 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 4-5 2.0 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

Commenter's Reason: Current language in the code is inadequate to ensure that the health and safety protection provided by a shower mixing valve is not diminished by mismatching the rated flow of the valve with the flow rate of the showerhead during installation. This public comment modifies the original proposal by changing the flow rate to 2.0 gpm, matching the current IgCC requirement, and ensuring that the protective components of the valve will not be compromised by the flow rate required by the IgCC. The marking requirement is critical to enable the code official to do his or her job efficiently.

This public comment addresses the Committee's reason for disapproval, which was, "The proposed changes are safety related items that are better suited to be proposed to the IPC." We agree that the IPC should also include provisions to provide thermal protection to consumers. However, the IgCC is described as follows on its website: "...the first model code to include sustainability measures for the entire construction project and its site — from design through construction, certificate of occupancy and beyond. The new code is expected to make buildings more efficient, reduce waste, and have a positive impact on health, safety and community welfare." As such, it would seem that the IgCC should address health and safety issues that arise when market changes -- spurred, in part, by the IgCC itself -- move towards greater efficiency faster than the accompanying standards can move. As noted in our original reason statement, showerheads with maximum flow rates of 2.0 gpm and below are widely available on the market today and simple replacement of a showerhead is typically not subject to code. The current U.S. EPA WaterSense specification for showerheads has a maximum flow rate of 2.0 gpm, and more than 800 WaterSense showerheads (from 45 manufacturers) are already available with flow rates between 2.0 and 1.5 gpm. Given the findings of the studies cited in our original reason statement and current manufacturing trends, matching of showerheads to shower control valves is more essential to user health and safety than was the case previously.

Two additional points:

1. The 2012 Uniform Plumbing Code, Section 408.3, contains similar provisions as to 'matching' valve and showerhead flow rates as follows: "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 of the installed showerhead." The IgCC should be no less protective of public health than the UPC.
2. The two relevant product standards (ASSE 1016-2011/ASME A112.1016-2011/CSA B125.16-11 for shower control valves and ASME A112.18.1-2011/CSA B125.1-11 for showerheads) both provide for marking of flow rates on their respective packaging. Showerheads are required to be marked with their flow rate; however, the 1016 standard does not require shower control valves to be marked with the minimum rated flow. Both standards also recommend on their packaging that showerhead and shower control valve be matched as to flow rate.

GEW149-14

GEW150-14

702.1, Table 702.1, 702.2

Proposed Change as Submitted

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 1.75 gpm and WaterSense labeled
Lavatory faucet and bar sink— private	4.5 1.0 gpm
Lavatory faucet—public (metered)	0.25 gpc ^b
Lavatory faucet—public (nonmetered)	0.5 gpm
Kitchen faucet and bar sink— private	2.2 2.0 gpm
Kitchen and bar sink faucets in other than dwelling units and guestrooms	2.2 gpm
Urinal	0.5 0.125 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 banned 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The reduction of shower head flow will be too much of a sacrifice for users. The current designs of 1.75 gpm showerheads do not offer a reasonable level of comfort for most users.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Kathleen Petrie, City of Seattle, Department of Planning and Development, representing Regional Code Collaboration (kathleen.petrie@seattle.gov); Maureen Traxler, Washington Association of Building Officials Technical Code Development Committee (maureen.traxler@seattle.gov) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

702.1 Fitting and fixture consumption. Fixtures shall comply with Table 702.1 and the following:

- 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	1.75 <u>2.0</u> gpm and WaterSense labeled
Lavatory faucet—private	1.0 gpm
Lavatory faucet—public (metered)	0.25 gpc ^b
Lavatory faucet—public (nonmetered)	0.5 gpm
Bar Sink Faucet—private	<u>1.0 gpm</u>
Kitchen faucet and bar sink —private	2.0 gpm
<u>Kitchen and bar sink faucets in other than dwelling units and guestrooms</u>	<u>2.2 gpm</u>
Urinal	0.125 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
Preinse spray valves	1.28 gpm and Watersense labeled
Drinking fountains (manual)	0.7 gpm
Drinking fountains (metered)	0.25 gpc ^b

Commenter's Reason: The following changes have been made to Table 702.1:

- The shower head flow requirement has been increased from 1.75gpm back to the original 2.0gpm based on feedback from the IGCC Hearing Committee who stated that the current 1.75 gpm showerheads do not offer a reasonable level of comfort for most users.
- The reference to kitchen and bar sink faucets in other than dwelling units and guestrooms has been returned to the original IGCC 2012 language based on feedback from the IGCC Hearing Committee.

GEW150-14

GEW151-14

Table 702.1

Proposed Change as Submitted

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,g}**

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 at 60 psi
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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The Committee was opposed to removal of Chapter 6 regulating energy conservation from the IgCC. Even if jurisdictions choose to not adopt one chapter or another, the IgCC needs to contain the full complement of topics. If the code doesn't contain a chapter on energy conservation, there is no chapter available for adopting jurisdictions to consider. The general topic areas regulated in the IgCC need to remain consistent with the ICC 700

Assembly Motion:

Approved as Submitted

Online Vote Results:

Failed - Support: 50% (97) Oppose: 50% (97)

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Hope Medina, Cherry Hills Village, representing Colorado Chapter of International Code Council (hmedina@coloradocode.net); Craig Conner (craig.conner@mac.com) requests Approve as Modified by this Public Comment; Gary Klein, representing self (gary@aim4sustainability.com)

Modify the proposal 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 AND QUANTITIES
FOR REDUCED WATER CONSUMPTION^{f,g}**

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 at 60 psi

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE
Kitchen faucet—private	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

Commenter's Reason: The values and testing standards are what should be placed in the code. EPA's WaterSense is a governmental funded program which is subject to budget cuts or with a change of administration may no longer exist. EPA's WaterSense program values are not set through a consensus process, as this code or standards within the I code family are. We have no control over what direction the EPA's WaterSense program may choose to go, but we do have control over this code with its values.

By requiring these fixtures to be labeled in accordance to WaterSense we may start to eliminate innovation from smaller companies that would not have the financial opportunity to acquire the WaterSense label, but have products that meet or exceed those specific requirements.

Public Comment 2:

Shawn Strausbaugh, Arlington County, VA, representing Arlington County, VA (sstrausbaugh@arlingtonva.us) requests Approve as Modified by this Public Comment.

Modify the proposal 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 AND QUANTITIES FOR REDUCED WATER CONSUMPTION^{f, g}**

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 at 60 psi
Kitchen faucet—private	1.8 gpm at 60 psi ^g
Kitchen and bar sink faucets in other than dwelling units and guestrooms	2.2 gpm at 60 psi ^g
Urinal	0.5 gpf and WaterSense labeled or nonwater urinal

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE
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
Preinse spray valves	1.3 gpm and WaterSense labeled
Drinking fountains (manual)	0.7 gpm ^f
Drinking fountains (metered)	0.25 gpc ^{bb, t}

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 Water dispensers 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 2.2 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.

Commenter's Reason: The term bottle filling stations has been struck and replaced with water dispenser which is a defined term in the 2015 IPC. This term includes any plumbing fixture that dispenses potable drinking water into a receptacle such as a cup, glass, or bottle.

As stated in the original reason statement there is no reason to limit the flow rate of such as device as it will not save water just lengthen the time to fill the receptacle

GEW151-14

GEW154-14 202, 702.5 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Bottle filling stations should not be a mandatory substitution for drinking fountains.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

John Watson, representing Elkay Manufacturing (john.watson@elkay.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

~~702.5 Bottle filling stations~~ **Water Dispensers.** ~~Bottle filling stations~~ Water dispensers shall be integral to, or used as a substitute for, not less than 50 percent of the required number of drinking fountains.

Commenter's Reason: The discussion at the Committee Hearing was centered more around the language being correct than it was about the concept being accepted; that is, I believe the Committee felt the concept was good but that we needed to get the language correct. Given that, I've modified that language to utilize the term "water dispenser" which is consistent with the definitions used in the 2015 IPC.

The reason for using of water dispensers remains the same as the original proposal - they save water and generate less plastic bottle waste.

Public Comment 2:

John Watson, representing Elkay Manufacturing (john.watson@elkay.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

**SECTION 202
DEFINITIONS**

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.

Commenter's Reason: With the term "water dispenser" written into the 2015 IPC, there is no need to define the term in this IgCC document.

GEW154-14

GEW156-14

702.6.4 (New), 702.6.5 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Section 702.16 already has limitations for water flow for food waste disposers for commercial food establishments. The proposed language would be inappropriate for residential occupancies that are within the scope of coverage of the IgCC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Julius Ballanco, JB Engineering, representing InSinkErator (JBENGINEER@aol.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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.~~

702.16 Food waste disposers. The water flow into a commercial food waste disposer in a food establishment shall be controlled by a load-sensing device such that the water flow does not exceed 1 gpm (3.78 Lpm) under no-load operating conditions and 8 gpm (30.2 Lpm) under full-load operating conditions. Such 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~~ **702.17 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.

Commenter's Reason: The mistake made with the original proposal was following the electronic edition of the 2012 IgCC rather than the printed version. The change has been corrected to address the existing Section 702.16 to include a run-cycle time limiting means. This prevents a food waste disposer from wasting energy by operating for long periods of time. Manufacturers have this type of control available for disposers.

The other two devices used in commercial kitchens, pulpers and mechanical strainers, are not currently regulated by the IgCC. These devices can waste large quantities of water which is not green. Pulpers have been proven to operate efficiently with 2 gpm or less of water. Similarly, mechanical strainers only require 2 gpm. Both devices can be turned on and operated for a long period of time, even when they are not in use. By having a run-cycle time limiting means, energy is saved. This is a necessary green requirement.

GEW156-14

GEW159-14

702.8, 702.8.1, 702.8.2, Table 702.8.2, 702.8.2.1

Proposed Change as Submitted

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

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)
5/8	2	32	12	4
¾	3	24	8	0.5
7/8	4	16	6	0.5
1	5	13	5	0.5
1 ¼	8	8	3	0.5
1 ½	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

Public Hearing Results

The following is errata that was posted to the ICC website:

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).~~

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.

(Errata already incorporated into cdpACCESS.)

Committee Action:

Approved as Submitted

Committee Reason: The changes in the proposal are necessary to correlate with the language in the 2015 IECC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Gary Klein, representing self (gsmklein@comcast.net) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

702.8 Efficient heated water supply piping. Heated water supply piping to plumbing fixtures and appliances shall be in accordance with Section 702.8.1 or C404.5 of the International Energy Conservation Code except that the maximum allowable piping lengths in the "Other fixtures and appliances" column of Table C404.5.1 of the IECC shall be as indicated in Table 702.8 and the maximum volume indicated in Section 702.8.2. The flow rate through 1/4 inch piping C404.5.2 of the IECC for other fixtures and appliances shall not exceed 0.5 gpm be 24 ounces (1.9 Lpm 0.72 L). 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).

702.8.1 Maximum allowable pipe length method. ~~For fixtures other than public lavatory faucets, the maximum allowable piping length from the nearest circulation loop pipe or an electrically heat-traced pipe to the termination of the fixture supply pipe shall be in accordance with the maximum pipe length column 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 circulation loop pipe or an electrically heat-traced pipe shall be 24 ounces (0.7 L).~~

**TABLE 702.8.2 702.8
PIPE VOLUME AND MAXIMUM PIPING LENGTH**

NOMINAL PIPE OR TUBE SIZE (inch)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPING LENGTH (feet)
$\frac{1}{4}$ ^{-a}	0.33	16
$\frac{5}{16}$ ^{-a}	0.5	16
$\frac{3}{8}$ ^{-a}	0.75	16
$\frac{1}{2}$	1.5	16
$\frac{5}{8}$	2	12
$\frac{3}{4}$	3	8
$\frac{7}{8}$	4	6
1	5	5

NOMINAL PIPE OR TUBE SIZE (inch)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPING LENGTH (feet)
1 ¼	8	3
1 ½	11	2
2 or larger	18	1

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 ¼-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 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. The volume shall include the portion of the fitting on the branch pipe that supplies water to the fixture.

Commenter's Reason: Availability of the 2015 IECC now allows for a better understanding of what the original proposal was trying to accomplish. Although I am very appreciative of the Committee's understanding and approval of the proposal's original form, some opposing testifiers were confused about the intent. This Public Comment should clear up the confusion and make the IgCC much easier to understand.

Section C404.5 of the 2015 IECC limits the volume of water in heated water piping from the source of the heated water to the end of the plumbing fixture (or appliance) supply pipe.

The volume limitation for piping to "all other fixtures and appliances" is limited (by Section C404.5 of the IECC) so that the user doesn't waste a significant amount of water while waiting for heated water to arrive at the fixture. Any inefficient heated water piping arrangements have significant local (and regional) energy use implications as well as water waste implications.

The purpose of revising Section 702.8 in the IgCC is simply to reduce the volume limitation for heated water piping to "all other fixtures and appliances". The volume limitations in the 2015 IECC for these fixtures are quite liberal and easy to attain with some simple planning. With better planning of the piping arrangement and better choice of pipe sizes, significantly more water volume can be saved from going down the drain before the user starts to use the fixture. Consider the age old practice of turning on the hot water in a shower, leaving the room to go make coffee and then coming back to get in the shower because that's how long it takes for the hot water to arrive at the shower head! At 2.0 gallons per minute shower head flow, a five minute delay in use means that 10 gallons of potable water has gone to waste. Per person! Other fixtures have similar water waste problems.

I urge your approval of my refined proposal that already initially received approval from the Committee.

For your reference, here is the language for Section C404.5 of the 2015 IECC:

C404.5 Efficient heated water supply piping. Heated water supply piping shall be in accordance with Section C404.5.1 or Section C404.5.2. The flow rate through ¼ inch piping shall not exceed 0.5 gpm (1.9 L/m). The flow rate through 5/16 inch piping shall not exceed 1 gpm (3.8 L/m). The flow rate through 3/8 inch piping shall not exceed 1.5 gpm (5.7 L/m).

Maximum allowable pipe length method. The maximum allowable piping length from the nearest source of heated water to the termination of the fixture supply pipe shall be in accordance with the following. Where the piping contains more than one size of pipe, the largest size of pipe within the piping shall be used for determining the maximum allowable length of the piping in Table C404.5.1.

1. For a public lavatory faucet; use the "Public lavatory faucets" column in Table C404.5.
2. For all other plumbing fixtures and plumbing appliances; use the "Other fixtures and appliances column" in Table C404.5.1.

TABLE C404.5.1
PIPING VOLUME AND MAXIMUM PIPING LENGTHS

Nominal Pipe Size (inch)	Volume (liquid ounces per foot length)	Maximum Piping Length (feet)	
		PUBLIC LAVATORY FAUCETS	OTHER FIXTURES AND APPLIANCES
1/4	0.33	6	50
5/16	0.5	4	50
3/8	0.75	3	50
1/2	1.5	2	43
5/8	2	1	32
3/4	3	0.5	21
7/8	4	0.5	16
1	5	0.5	13

1 ¼	8	0.5	8
1 ½	11	0.5	6
2 or larger	18	0.5	4

For SI: 1 Gallon = 128 ounces. >For SI: 1 inch=25.4 mm, 1 foot = 304.8 mm, 1 liquid ounce = 0.030 L

C404.5.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section C404.5.2.1. Water heaters, circulating water systems and heat-trace temperature maintenance systems shall be considered sources of heated water. The volume from the nearest source of heated water to the termination of the fixture supply pipe shall be as follows:

1. For a public lavatory faucet: no more than 2 ounces (0.06 L).
2. For other plumbing fixtures or plumbing appliances; no more than 0.5 gallon (1.89 L)

C404.5.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the nearest source of heated water and the termination of the fixture supply pipe. The volume in the piping shall be determined from the volume column in Table C404.5.1. The volume contained within fixture shut off valves, within flexible water supply connectors to a fixture fitting and within a fixture fitting shall not be included in the water volume determination. Where heated water is supplied by a recirculating system or heat-traced piping, the volume shall include the portion of the fitting on the branch pipe that supplies water to the fixture.

Public Comment 2:

Caija Owens, representing National Association of Home Builders (cowens@nahb.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

702.8 Efficient ~~heated~~ 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).

702.8.1 Maximum allowable pipe length method. For fixtures other than public lavatory faucets, the maximum allowable piping length from the outlet of heated water source, nearest circulation loop pipe or an electrically heat-traced pipe to the termination of the fixture supply pipe shall be in accordance with the maximum pipe length column 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 outlet of the heated water source, nearest 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**

NOMINAL PIPE OR TUBE SIZE (inch)	<u>VOLUME</u> (liquid ounces per foot of length)	MAXIMUM PIPING LENGTH (feet)
1/4 ^a	0.33	16
5/16 ^a	0.5	16
3/8 ^a	0.75	16

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.

(Portions of the table not shown remain unchanged)

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 outlet of the heated water source, the circulation loop pipe or an electrically heat-traced pipe and the termination of the fixture supply pipe. The volume of the piping shall be determined from the volume liquid ounces per foot column of Table 702.8.2 or the actual volume derived from internal dimensions of the piping. 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. The volume shall include the portion of the fitting on the branch pipe that supplies water to the fixture.

Commenter's Reason:

702.8

The section should be titled "Heated Water Supply Piping" as using the word "Efficient" in the title isn't good code language.

702.8.2.1

In order to support this proposal a "fix" has been provided that would allow for a more accurate selection of piping. It has been determined that CPVC and PEX volume per unit length are as much as 30% less volume per unit length than volumes in table 702.8.2 based on the calculated comparison to Copper and PVC. For example, for 3/4 inch piping the proponent states that 8 feet is the appropriate length, however when using PEX, accurate length is 10.2 ft (24 oz as per table 702.8.2 divided by 2.35 PEX liquid oz per foot length). Another example is for 1 inch piping the proponent states that 5 feet is the appropriate length, however when using PEX, accurate length is 6.4 ft (25 oz as per table 702.8.2 divided by 3.91 PEX liquid oz per foot length). Piping lengths should be neutral and should not place users of different materials at a disadvantage. In order to accurately determine interior pipe volume users should be permitted to use manufacturer's dimensions.

The original proposal also does not address systems that should not need a circulation loop. As written it appears that all systems, regardless of length, require a circulation loop. More compact systems that meet the maximum pipe length from the hot water source to the fixture supply pipe should also be acceptable.

Footnote "a" is being removed because it is redundant and is already mentioned in 702.8.

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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

Proposed Change as Submitted

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.

W160-14: 702.8.1-CUDAHY839

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The addition of more tables for piping lengths and volume would be in conflict with the 2015 IECC.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Michael Cudahy, representing Plastic Pipe and Fittings Association (mikec@cmservices.com) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

702.8 Efficient hot and tempered heated water distribution supply piping. Hot and tempered ~~Heated~~ water distribution shall comply with either the maximum pipe length or maximum pipe volume limits in this section. Hot and tempered water supply piping 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 ~~The flow rate through 1/4 inch piping shall include tubing not exceed 0.5 gpm (1.9 Lpm). For purposes of this section, the source of hot or tempered water~~ The flow rate through 5/16 inch piping shall be considered to be a water heater, boiler, circulation loop not exceed 1 gpm (3.8 Lpm). The flow rate through 3/8 inch piping or electrically heat-traced piping shall not exceed 1.5 gpm (5.7 Lpm).

702.8.1 Maximum allowable pipe length method. ~~The For fixtures other than public lavatory faucets, the~~ maximum allowable pipe piping length from the ~~source of hot nearest circulation loop pipe or tempered water an electrically heat-traced pipe~~ to the termination of the fixture supply pipe shall be in accordance with the maximum pipe length columns in Tables ~~702.8.2 702.8.1(2)~~ through ~~702.8.2 702.8.1(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 ~~702.8.2 702.8.1(2)~~ through ~~702.8.2 702.8.1(10)~~, Table ~~702.8.2 702.8.1(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 Maximum allowable pipe volume method. The maximum ~~water~~ volume of hot or tempered water in the piping to public lavatory faucets, metering or nonmetering, shall be 2 ounces (0.06 L) calculated in accordance with Section 702.8.2.1. For fixtures other than public lavatory faucets, the maximum volume shall be 64 ounces (1.89 L) for hot or tempered of heated water from a water heater or boiler; and 24 ounces (0.7 L) for hot or tempered water in the piping from a ~~the nearest~~ 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 24 ounces (0.7L).~~

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~~ circulation loop pipe or an electrically heat-traced pipe and the termination of the fixture supply pipe. The volume shall be determined from the liquid ounces per foot of length column of ~~the appropriate~~ Tables ~~702.8.2 (2)~~ 702.8.1 (2) through ~~702.8.2 702.8.1(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 ~~702.8.2 702.8.1(2)~~ through ~~702.8.2 702.8.1(10)~~, Table ~~702.8.2 702.8.1 (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~~ The volume shall include the portion of the fitting on the source branch pipe that supplies water to the fixture.

**TABLE 702.8.2 702.8.1(1)
VOLUME AND MAXIMUM LENGTH OF PIPE OR TUBE OF A TYPE UNKNOWN OR NOT COVERED^{ba}**

NOMINAL PIPE OR TUBE SIZE (inch)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPE OR TUBE 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

NOMINAL PIPE OR TUBE SIZE (inch)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPE OR TUBE 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)
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.

b. Not covered means pipe or tube types not covered by Tables 702.8.2-2 702.8.1(2) through 702.8.2-702.8.1(10).

TABLE 702.8.2(2) 702.8.1(2)
VOLUME AND MAXIMUM LENGTH OF TYPE K COPPER TUBING

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Tube Length (feet)		
		System without a Circulation Loop or Heat Traced Line (feet)	System with a Heat Traced Line (feet)	Lavatory Faucets - Public (metering and non-metering) (feet)
3/8 ^a	0.84	44.6	14.3 28.6	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) 702.8.1(3)
VOLUME AND MAXIMUM LENGTH OF TYPE L COPPER TUBING

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Tube 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 non-metering) (feet)
3/8 ^a	0.97	38.7	12.4 24.7	2.3
1/2	1.55	41.6	15.5	1.9
3/4	3.22	19.6	7.5	0.5
1	5.49	11.8	4.6	0.5
1 1/4	8.38	7.6	2.9	0.5
1 1/2	11.83	5.6	1.9	0.5
2 or larger	20.58	3.5	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(4) 702.8.1(4)
VOLUME AND MAXIMUM LENGTH OF TYPE M COPPER TUBING

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Tube 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 non-metering) (feet)
3/8 ^a	1.06	35.4	11.3 22.6	2.1
1/2	1.69	38.2	14.2	1.8
3/4	3.43	18.4	7.0	0.4
1	5.81	11.2	4.3	0.4
1 1/4	8.70	7.4	2.8	0.5
1 1/2	12.18	5.4	1.8	0.5
2 or larger	21.08	3.4	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(5) 702.8.1(5)**VOLUME AND MAXIMUM LENGTH OF CPVC TUBING, CTS^a**

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Tube 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 non-metering) (feet)
1/2	1.25	51.6	19.2	2.4
3/4	2.67	23.6	9.0	0.6
1	4.43	14.7	5.6	0.6
1 1/4	6.61	9.7	3.6	0.6
1 1/2	9.22	7.2	2.4	0.6
2 or larger	15.79	4.6	1.1	0.6

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) 702.8.1(6)**VOLUME AND MAXIMUM LENGTH OF CPVC PIPE, SCHEDULE 40**

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Pipe 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 non-metering) (feet)
3/8 ^a	1.17	32.1	40.3 20.5	1.9
1/2	1.89	34.1	12.7	1.6
3/4	3.58	17.6	6.7	0.4
1	5.53	11.8	4.5	0.5
1 1/4	9.66	6.6	2.5	0.4
1 1/2	13.20	5.0	1.7	0.4
2 or larger	21.88	3.3	0.8	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(7) 702.8.1(7)**VOLUME AND MAXIMUM LENGTH OF CPVC PIPE, SCHEDULE 80**

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Pipe 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 non-metering) (feet)
3/8 ^a	0.86	43.6	14.0 27.4	2.6
1/2	1.46	44.2	16.4	2.1
3/4	2.74	23.0	8.8	0.5
1	4.56	14.3	5.5	0.5
1 1/4	8.24	7.8	2.9	0.5
1 1/2	11.38	5.8	1.9	0.5
2 or larger	19.11	3.8	0.9	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 3/8 inch size is limited to 1.5 gpm

TABLE 702.8.2(8) 702.8.1(8)**VOLUME AND MAXIMUM LENGTH OF PE-AL-PE TUBING**

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Tube 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 non-metering) (feet)
3/8 ^a	0.63	59.5	19.0 38.1	3.6
1/2	1.31	49.2	18.3	2.3
3/4	3.39	18.6	7.1	0.4
1	5.56	11.7	4.5	0.4
1 1/4	8.49	7.5	2.8	0.5
1 1/2	13.88	4.8	1.6	0.4
2 or larger	21.48	3.4	0.8	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(9) 702.8.1(9)**VOLUME AND MAXIMUM LENGTH OF PEX AND PE-RT TUBING, CTS^b**

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Tube 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 non-metering) (feet)
3/8 ^a	0.6	58.6	18.8 37.5	3.5
1/2	1.18	54.7	20.3	2.5
3/4	2.35	26.8	10.2	0.6
1	3.91	16.6	6.4	0.6
1 1/4	5.81	11.0	4.1	0.7
1 1/2	8.09	8.2	2.7	0.7
2	13.86	5.2	1.3	0.6

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) 702.8.1(10)**VOLUME AND MAXIMUM LENGTH OF PEX-AL-PEX TUBING**

Nominal Tube Size (inch)	Liquid Ounces per Foot of Length	Maximum Tube 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 non-metering) (feet)
3/8 ^a	0.63	59.5	19.0 38.1	3.6
1/2	1.31	49.2	18.3	2.3
3/4	3.39	18.6	7.1	0.4
1	5.56	11.7	4.5	0.4
1 1/4	8.49	7.5	2.8	0.5
1 1/2	13.88	4.8	1.6	0.4
2 or larger	21.48	3.4	0.8	0.4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per min

a. The flow rate for 3/8 inch size is limited to 1.5 gpm.

Commenter's Reason: This comment modifies the original proposal to fit the format and content of proposal GEW 159-14, and matches the tables to that format, and corrects a spreadsheet error for 3/8" volumes. The 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. One could imagine the challenges that could occur if a building was designed in a way that did not deliver the hot water as calculated.

GEW160-14

GEW161-14

702.10, Chapter 12

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The IAPMO standard is not a consensus document. Currently, there are no known water-powered sump pumps that can meet the criteria of the proposed standard.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Jeffrey Waterman, representing Liberty Pumps, Inc. requests Approve as Modified by this Public Comment.

Modify the proposal 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 1.4 gallons (5.3 L) of water to a height of 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.

Modify standard as follows:

IAPMO Group
4755 E. Philadelphia
Ontario, CA 91761

IAPMO PS 119-2012ae1 Water-Powered Sump Pumps

Commenter's Reason: I propose that GEW 161-14 be approved, but with the last sentence referencing IAPMO PS 119 removed. Also remove the request that IAPMO PS 119-2012ae1 be added to the IGCC as a reference standard.

The Committee action to disapprove GEW 161-14 was correct as per their given reason that the proposed modification to the IGCC Section 702.10 included reference to the non-consensus document IAPMO PS 119. The as-documented Committee Reason also however incorrectly states that no water-powered pumps can meet the criteria of the proposed standard. What actually was said at the hearing, and what the proponent's primary point in requesting the change to the IGCC, was that no water-powered pumps meet the requirements of the IGCC 2012, and this change was proposed to correct this.

The facts stated in the proponent's original reasons for requesting the rest of the change remain. The performance criteria used for IGCC 2012, Section 702.10, was developed prior to having accurate performance data available. IAPMO's Green Plumbing and Mechanical Code Supplement (GPMCS), was re-written for the 2012 edition subsequent to the analysis of the IAPMO listed water powered pumps on the market. The changes to the 2012 GPMCS would allow use of WPP's so long as they were a backup to primary electric pumps, they were equipped with a usage alarm, and they had the performance values as proposed in GEW 161-14.

For the sake of harmonization between the respective Green Codes, 702.10 should be changed as per GEW 161-14, but with the elimination of the last sentence that references IAPMO PS119. Showing the other changes from the initial proposal, the modification would read as follows:

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.

GEW161-14

GEW162-14

702.18, 702.18.1

Proposed Change as Submitted

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 162workgroup 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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There is too much water wasted by autoclaves and sterilizers to justify completely removing the current code requirements. Perhaps an exception for health care facilities could be brought forth in a public comment.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

John Williams, representing Adhoc Health Care Committee (AHC@iccsafe.org) requests Approve as Modified by this Public Comment.

Replace proposal as follows:

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.

Exception: Autoclaves and sterilizers in Group I-2, Condition 2 facilities and ambulatory care facilities are not required to comply with this section.

Commenter's Reason: This proposal responds to the committee reason. The committee felt that autoclaves and sterilizers should not be removed totally from the requirements, but that an exception specific to health care facilities to address the health concerns brought up by the Adhoc Health Care committee. These concerns are:

Availability of medical grade sterilizers that are designed for use with non-potable water.

Sterilizers are regulated by FDA and the FDA has not approved any medical grade sterilizer that is designed to use non-potable water. The development/clearance process for a medical grade sterilizer to use non-potable water will take a minimum of 3-5 years if the FDA is willing to approve such a design. This approval may not be obtainable due to the fact that non-potable water could be an infection risk when aerosols are creating during discharge process. Since there is not an available solution on the market to currently meet this code of no-potable water use this exception is necessary.

Sterilizers are used in two primary locations:

DEDICATED STERILE PROCESSING DEPARTMENT (SPD) - large volume batch processing of ALL instrumentation in for surgical use. These sterilizer units use vacuum pumps and not venturi systems.

OPERATING ROOM - Secondary location is within the OR Suite, a sensitive clinical environment where sterilizer cycles are used for emergency situations only (rarely used/low volume). Sterilizers are in rooms connected/immediately adjacent to surgeons operating on patients, where mechanical noise of pumps, compressors, or other intermittent loud sounds should be avoided. Healthcare governing agencies such as AAMI and AORN recommend the elimination of sterilizer cycle use in the OR where possible.

ISSUES WITH CURRENT CODE REQUIREMENTS:

Surgical Disruption - Surgical sterilizers continue to use venturi systems to prevent pump cycling noise immediately adjacent to an Operating Room, where procedures such as Neuro Surgery, Ophthalmology and other sensitive procedures are done. Clinicians do not want the noise to distract surgery.

Limited Options for Customers - Only one manufacturer currently offers a non-venturi system for the OR, which would limit options for hospitals.

Public Comment 2:

John Williams, representing Adhoc Health Care Committee (AHC@iccsafe.org) requests Approve as Modified by this Public Comment.

Replace proposal as follows:

702.18.1 Vacuum autoclaves and sterilizers. Vacuum sterilizers shall be prohibited from utilizing venturi-type vacuum mechanisms using water.

Commenter's 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. Proprietary requirements are a violation of CP28 Section 3.6.

Additionally, sterilizers are used in two primary locations:

DEDICATED STERILE PROCESSING DEPARTMENT (SPD) - large volume batch processing of ALL instrumentation in for surgical use. These sterilizer units use vacuum pumps and not venturi systems

OPERATING ROOM - Secondary location is within the OR Suite, a sensitive clinical environment where sterilizer cycles are used for emergency situations only (rarely used/low volume). Sterilizers are in rooms connected/immediately adjacent to surgeons operating on patients, where mechanical noise of pumps, compressors, or other intermittent loud sounds should be avoided. Healthcare governing agencies such as AAMI and AORN recommend the elimination of sterilizer cycle use in the OR where possible.

ISSUES WITH CURRENT CODE REQUIREMENT:

Surgical Disruption - Surgical sterilizers continue to use venturi systems to prevent pump cycling noise immediately adjacent to an Operating Room, where procedures such as Neuro Surgery, Ophthalmology and other sensitive procedures are done. Clinicians do not want the noise to distract surgery.

Limited Options for Customers - Only one manufacturer currently offers a non-venturi system for the OR, which would limit options for hospitals.

GEW162-14

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 $\mu\text{S}/\text{ml}$
2. pH
3. Total Hardness in ppm as CaCO_3
4. Ca Hardness in ppm as CaCO_3
5. Mg Hardness in ppm as CaCO_3
6. Alkalinity in ppm as CaCO_3
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.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Although the proposed requirements may be a best practices approach, other items such as phosphates and suspended solids are not addressed. The Committee recommends that a public comment be submitted to address those items and possibly other water quality issues that are related to cooling towers.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Daryn Cline, EVAPCO, Inc., representing EVAPCO (dcline@evapco.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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 $\mu\text{S}/\text{ml}$
2. pH
3. Total Hardness in ppm as CaCO_3
4. Ca Hardness in ppm as CaCO_3
5. Mg Hardness in ppm as CaCO_3
6. Alkalinity in ppm as CaCO_3
7. Silica in ppm
8. Chlorides in ppm
9. Sulfate in ppm
10. Phosphate in ppm
- 10-11. Iron in ppm
12. Total Suspended Solids in ppm

The plan shall:

1. ~~Address~~ the control of microbiological activity, scale and corrosion.
2. ~~specify~~ Specify the equipment and products used for treating the water of an open recirculating loop.
3. ~~maximize~~ Maximize cycles of concentration as required by Section 703.7.7.
4. ~~address~~ Address equipment and product compatibility with equipment materials of construction and system metallurgy.
5. ~~include~~ Include a schedule for the required inspection, maintenance and monitoring of the system and shall include a corrective actions log.
6. ~~include~~ Include owner's training and commissioning documents.
7. ~~identify~~ Identify the persons responsible for providing and maintaining the system water treatment.

Commenter's Reason: It is reasonable to include phosphates in the analysis as well as total suspended solids. TSS is valuable when considering the use of alternate water sources.

I have revised the table to include these parameters.

GEW173-14

GEW174-14

703.7.7, Table 703.7.7

Proposed Change as Submitted

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

<u>MAKEUP WATER TOTAL HARDNESS (mg/L)^a</u> <u>PARAMETER</u>	<u>MINIMUM CYCLES OF</u> <u>CONCENTRATION</u> <u>MAXIMUM</u> <u>VALUE</u>
<200 <u>Langelier Stability</u> <u>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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Cycles of concentration depend greatly on the source water used. Holding time index should be considered. LSI is not a good predictor of corrosion issues. The Committee suggests that a public comment be made to make the proposed requirements more technical.

Assembly Action:

None

Individual Consideration Agenda

Public Comment:

Daryn Cline, EVAPCO, Inc., representing EVAPCO (dcline@evapco.com) requests Approve as Submitted.

Commenter's Reason: We agree on the committee's comment regarding cycle levels and water source. EVAPCO's submitted table of parameters provides a better technical solution to the existing language which was based on water hardness only.

The Table of Parameters, with not to exceed values, provides more flexibility with varying water chemistries and closely aligns with the current LEEDv4 WE Cooling Tower Water Use credit, albeit our parameters are slightly more conservative. But overall, it seeks to maximize water savings and cycles of concentration to levels that are acceptable and maintain equipment longevity.

Regarding the consideration of a holding time index, it would be hard to quantify in a table, considering varying system volume, cycles of concentration and treatment program required.

Holding time is defined as the time required for 50% of the chemical treatment to remain in the system, and calculated as $.7 \times \text{Volume of system (gallons)} / \text{Blowdown rate (gpm)} = .7 \times V / B$ and should be considered when designing a water treatment program.

Since Section 703.7.7 Discharge Water is focused on water efficiency or conservation, I would not add Holding Time Index in this section, but maybe add to Section 703.7.6.1. Water Treatment Plan.

Agree, LSI is a predictor of scale formation, not corrosion. Corrosion coupons could be considered and added to the water treatment plan in Section 703.7.6.1.

GEW174-14

GEW176-14

703.10 (New)

Proposed Change as Submitted

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

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal could have far-reaching effects such as prohibiting certain types of systems. It is unclear what qualifies as the standard reference design.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Steven Rosenstock, Edison Electric Institute, representing Edison Electric Institute (srosenstock@eei.org) requests Approve as Submitted.

Commenter's Reason: The term "Standard Reference Design" is defined in Chapter 2 of the IGCC. Any system that meets the IECC can be used in the Standard Reference Design. This will ensure that HVAC systems, whatever the choice(s), do not use more water in the proposed design.

Public Comment 2:

Charles Foster, representing Edison Electric Institute (cfoster20187@yahoo.com) requests Approve as Modified by this Public Comment.

Modify the proposal 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.~~

Commenter's Reason: This public comment would remove the exception from the proponent's original proposal.

With the exception removed, it simply requires a building's HVAC water consumption in the proposed building to no more than the HVAC water consumption in the reference building.

This is a very rational requirement and mimics the existing requirements for energy -- that energy consumption in the proposed building can not exceed energy consumption in the reference building.

GEW176-14

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 tenant <u>Non-residential tenant spaces</u>	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

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed requirements are really important to achieve lower water consumption by occupants in tenant spaces.

Assembly Action:

None

Individual Consideration Agenda

Public Comment 1:

Karen Hobbs, representing Natural Resources Defense Council (khobbs@nrdc.org) requests Approve as Modified by this Public Comment.

Modify the proposal as follows:

**TABLE 705.1.1
METERING REQUIREMENTS**

APPLICATION	REQUIREMENTS
Non-residential tenant <u>Commercial building spaces</u>	Non-residential tenant spaces such as for Medical offices, dental offices, dine-in restaurants, cafeterias and laundries and any other occupancy that is estimated to consume over 1000 gallons of water per day shall be metered individually.
Residential tenant spaces <u>dwelling units</u>	Residential tenant spaces <u>dwelling units</u> shall be metered individually.

Commenter's Reason: This proposal was approved as submitted. The Committee asked that two changes be made:

1. Remove the existing language on 1000 gallons of water per day; and
2. The Committee also asked that two terms be changed to align with existing IgCC or IECC definitions. As a result, "non residential tenant" has been changed to "commercial building" and "residential tenant spaces" changed to "residential dwelling units." Both "commercial building" and "dwelling unit" are defined in the IECC.

Public Comment 2:

Kirk Nagle, City of Arvada, representing Colorado Chapter ICC (knagle@arvada.org) requests Approve as Modified by this Public Comment.

Modify the proposal 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.

**TABLE 705.1.1
METERING REQUIREMENTS**

APPLICATION	REQUIREMENTS
Irrigation	In-ground Irrigation systems for outdoor landscaping shall be metered.
Non-residential tenant spaces	Non-residential tenant spaces such as for medical offices, dental offices, dine in restaurants, cafeterias, laundries and any other occupancy that are estimated to consume over 1000 gallons of water per day shall be metered individually.

(Portions of table not shown remain unchanged.)

Commenter's Reason: The original proposal was approved by the committee but it went backwards in relationship to saving water. In table 705.1.1 restricting monitoring to underground irrigation systems does not make sense because water leaking in any form is

bad, if your goal is to make sure your irrigation system is not wasting water. People that manage building and grounds do not always have the opportunity to check on the irrigation systems visually as they run, especially if they are running at night. Having personnel observe the irrigation system as it runs is not feasible and it could be months before a problem is noticed. Every time the irrigation system is in operation water is being wasted. Monitoring allows for a precise measurement of the water being used the day it happens, so the building and grounds personnel would be able to see that last night the irrigation system used an extra 100 gallons and they need to go find the leak and repair it. If you don't monitor all of the irrigation systems you would have no idea that you have a problem and you could be wasting thousands of gallons of water before the problem will be brought to the attention of the building and grounds crew. Wasting water does not just happen because the system is inground all systems can leak and monitoring is the best way to make the repairs before more water is wasted.

The second section of the table was modified to remove a list that does not clarify or enhance the code and in my opinion makes it probable for building officials/sustainability coordinators to overlook the other tenant spaces that also need to be monitored. By saying "all tenant spaces that use more than a 1000 gallons per day" is much clearer than having the statement "Non-residential tenant spaces such as medical offices dental offices, dine in restaurants, cafeterias, laundries and any other occupancies that are estimated to use more than 1000 gallons per day shall be metered individually." A laundry list is not effective for code compliance and having the extra language only causes confusion. This will help promote the application and usability of the IGCC and the water savings that we will get when monitoring all tenant spaces if they use more than 1000 gallons a day.

GEW180-14
