INTERNATIONAL CODE COUNCIL

2002 FINAL ACTION AGENDA FOR THE PROPOSED CHANGES TO THE 2000 EDITIONS* OF THE

INTERNATIONAL FIRE CODE
ICC PERFORMANCE CODE**
INTERNATIONAL EXISTING BUILDING CODE***
INTERNATIONAL BUILDING CODE
ICC ELECTRICAL CODE
INTERNATIONAL PROPERTY MAINTENANCE CODE
INTERNATIONAL ZONING CODE
INTERNATIONAL ENERGY CONSERVATION CODE
INTERNATIONAL RESIDENTIAL CODE
INTERNATIONAL PLUMBING CODE
INTERNATIONAL PRIVATE SEWAGE DISPOSAL CODE
INTERNATIONAL MECHANICAL CODE
INTERNATIONAL FUEL GAS CODE

*Including the 2002 Accumulative Supplement
**2001 Edition
***Final Draft

October 1 - 5, 2002
FORT WORTH CONVENTION CENTER
FORT WORTH, TEXAS
INTRODUCTION

This publication contains the Final Action Agenda for consideration at the joint annual meeting of the Building Officials and Code Administrators International, Inc. (BOCA), the International Conference of Building Officials (ICBO), and the Southern Building Code Congress International (SBCCI) in Fort Worth, Texas on October 1 - October 5, 2002.


AGENDA FORMAT

This Final Action Agenda includes the Consent Agenda and the Individual Consideration Agenda. The Consent Agenda is comprised of proposed changes to the 2000 editions of the International Codes including the 2002 Accumulative Supplement which are not listed on the Individual Consideration Agenda.

The Individual Consideration Agenda is comprised of proposed changes to the 2000 editions of the International Codes including the 2002 Accumulative Supplement which received a successful assembly action, received a public comment, or received hearing actions resulting in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Items on the Individual Consideration Agenda are published with information as originally published for the code development 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 any public comments which were received.

Public testimony will follow the ICC Code Development Process for the International Codes as published in this document. Refer to the tentative hearing order on page xi.

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

MODIFICATIONS BY ASSEMBLY ACTION AND PUBLIC COMMENT

New to the 2002 Code Cycle, revisions to Section 5.7.1 and Section 6.3.3 of the ICC Code Development Process for International Codes allow modifications to be proposed by the assembly at the code development hearings and by a public comment to code changes for consideration at the Final Action Hearings. Therefore, some proposed changes may have up to five possible motions - Approved as Submitted (AS), Approved as Modified by the Code Committee (AMCC), Approved as Modified by a successful Assembly Action (AMAA), Approved as Modified by a Public Comment (AMPC), or Disapproved (D).
CONSENT AGENDA

In accordance with Section 7.2 of the ICC Code Development Process for the International Codes, the Final Action Consent Agenda consists of proposals which have neither an assembly action nor public comment and proposals on which the public hearing actions result in technical consistency between the *International Residential Code* and the associated ICC *International Code* which also do not have an assembly action or public comment. In accordance with Section 7.3.1, the final action consent agenda shall be placed before the assembly with a single motion for final action in accordance with the results of the public hearing.

INDIVIDUAL CONSIDERATION AGENDA

The individual consideration agenda is comprised of proposals which have an assembly action or public comment and proposals on which the public hearing actions result in a technical inconsistency between the *International Residential Code* and the associated ICC *International Code*. According to Section 7.3.2, all proposed changes on the individual consideration agenda shall be placed before the assembly for individual consideration of each item. The individual consideration agenda is on the following pages.

ICC WEBSITE - WWW.INTLCODE.ORG

While great care has been exercised in the publication of this document, there may be errata posted for the Final Action Agenda. Errata, if any, identified prior to the Final Action will be posted on the ICC website at www.intlcode.org. Users are encouraged to periodically review the ICC Website for updates to errata to the 2002 Final Action Agenda.

CROSS INDEX OF PROPOSED CHANGES

The Cross Index of Proposed Changes lists proposed code changes that affect sections outside of the scope of the assigned codes or IBC chapters shown on page v of the proposed changes monograph. This information is provided to assist users in locating all of the proposed code changes that would affect a certain section or chapter. Please see page 513 for the index and additional information.

FINAL ACTION AGENDA SCHEDULE

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<td>Tuesday, October 1</td>
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<td>Saturday, October 5</td>
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**Note:** Start and finish times may be adjusted to complete the agenda.
7.0 Final Action Consideration

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

7.2 Agenda: The final action consent agenda shall be comprised of proposals which have neither an assembly action nor public comment and proposals on which the public hearing actions result in technical consistency between the International Residential Code and the associated ICC International Code which also do not have an assembly action or public comment. The agenda for public testimony and individual consideration shall be comprised of proposals which have an assembly action or public comment (see Sections 5.7 and 6.0) and proposals on which the public hearing actions result in a technical inconsistency between the International Residential Code and the associated ICC International Code.

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

7.3.1 Final Action Consent Agenda: The final action consent agenda (see Section 7.2) shall be placed before the assembly with a single motion for final action in accordance with the results of the public 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.

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

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

1. Allowable Final Action Motions: The only allowable motions for final action are Approval as Submitted, Approval as Modified by one or more modifications published in the Final Action Agenda, and Disapproval.
2. Initial Motion: The Code Development Committee recommendation shall be the initial motion considered.
3. 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 Final Action Agenda may be made (see Section 6.3.3). 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.
4. 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. If the motion fails to receive the majority required in Section 7.5, the Moderator shall ask for a new motion.
5. Subsequent Motion: If the initial motion is unsuccessful, a motion for one of the other allowable final actions shall be made (see Section 7.3.3[1]) and dispensed with until a successful final action is achieved.

7.4 Eligible Voters: Only the following individuals shall be eligible to vote for final action on code change proposals:

7.4.1 BOCA: Active members of BOCA in attendance at the BOCA annual meeting shall have one vote per eligible attendee on all International Codes.

7.4.2 ICBO: Class A voting representatives of ICBO in attendance at the ICBO annual meeting shall have one vote per eligible attendee on all of the International Codes’ agendas except the International Fire Code agenda. Each Voting Governmental member of the ICBO Fire Service Division shall have one vote on the International Fire Code agenda.

7.4.3 SBCCI: Active member representatives of SBCCI in attendance at the SBCCI annual meeting shall have one vote per
eligible attendee on all International Codes.

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

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<tr>
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<td>2/3 Majority</td>
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7.5.1 Failure to Achieve Majority Vote: In the event that a code change proposal does not receive any of the required majorities for final action in 7.5, final action on the code change proposal in question shall be disapproval.

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

8.0 Appeals

8.1 Right to Appeal: Any person shall have the right to appeal a substantive or procedural action or inaction in accordance with the policy of the ICC Board.

Appeals shall be based on substantive or procedural criteria, or both, and include a statement as to why the ICC action should be modified. The ICC will not render decisions on the relative merits of technical matters, but will consider whether due process was afforded technical concerns.

* Scoping Modifications: The intent of the Scoping Committee was for the code development process to provide for coordination between the International Codes by providing the membership with option for coordination. Code changes consisting of more than one item and heard by more than one code development committee, may be Approved as Submitted, Approved as Modified, or Disapproved in multiple forms by the committees, which may result in inconsistent actions. Therefore, modified text has been provided to allow the membership the opportunity to coordinate the technical provisions of the International Codes for those cases where an item was Approved as Modified by the code development committee for one item, and Approved as Submitted or Disapproved by the code development committee for the other item. These proposals, with an Approved as Modified option, are consistent with the modifications approved for the associated coordination change. These proposals will be on the individual consideration agenda. A 2/3 majority will be required for Approval as Modified where the committee action was Approved as Submitted or Disapproved.

The full ICC Code Development process for the International Codes including the most recent revisions are available on the ICC web site (www.intlcode.org) and from the offices of ICC.
Please see Instructions (Submittal Rules of Procedures). All submittals must be in compliance with these procedures. Closing Date: All Proposals Must Be Received by the Announced Closing Date.

1) Indicate the format in which you would like to receive your Public Proposals Monograph (PPM) or Report of the Hearing (ROH):
   - Paper
   - * CD
   - * Download

   (*Note: A paper copy will not be sent to you if you have chosen a CD or to download the PPM or ROH from the ICC Web Site.)

2) **PLEASE TYPE OR PRINT CLEARLY:** FORMS WILL BE RETURNED if they contain unreadable information.

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3) **Signature:** ____________

   I hereby grant the International Code Council the nonexclusive, royalty-free rights, including nonexclusive, royalty-free rights in copyright in this Proposal and I understand that I acquire no rights in any publication of International Code Council (ICC), in which this Proposal or another similar analogous form is used. I hereby attest that I have the authority and I am empowered to grant this copyright release.

4) Cost Impact: Indicate if this Proposal: ☐ will ☐ will not increase the cost of construction.

5) Indicate appropriate ICC Code or Standard associated with this Public Proposal – Please use Acronym: ____________

   (See instructions for list of Names and Acronyms for the I-Codes & I-Standards)

6) Revision to: ☐ Section ☐ Table ☐ Figure

7) **PROPOSAL** Revise as follows (check BOX and state proposed change):

   ☐ Revise as follows: ☐ Add new text as follows ☐ Delete and substitute as follows: ☐ Delete without Substitution:

   Show the proposed NEW or REVISED or DELETED TEXT in legislative format: Line through text to be deleted. Underline text to be added.

8) **SUPPORTING INFORMATION** (State purpose and reason, and provide substantiation to support proposed change):

   SUPPORTING INFORMATION Continued (Attach additional sheets as necessary)
GENERAL COPYRIGHT RELEASE
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INTERNATIONAL CODE COUNCIL

This form is for Copyright release for Proposals and Comments submitted via electronic format to the International Code Council, in which the required signature was not affixed. This signed Copyright release form will be kept on file, and can be used for all future Proposal and Comment submittals you send electronically to ICC. Please note on future submissions that the Copyright release is on file.

*I hereby grant the International Code Council the nonexclusive, royalty-free rights, including nonexclusive, royalty-free rights in copyright in this Proposal/Comment and I understand that I acquire no rights in any publication of International Code Council (ICC), in which this Proposal/Comment in this or another similar analogous form is used. I hereby attest that I have the authority and I am empowered to grant this copyright release.

*Signature: ____________________________________________________________

Please type or print full name: __________________________________________

Address: ___________________________________________________________________

Date Signed: __________________________________________________________________

PLEASE FAX THE SIGNED COPYRIGHT RELEASE TO

703-931-9128 or 703-379-1546

The signed Copyright release may also be mailed to:

ICC Program Manager
5203 Leesburg Pike, Suite 600
Falls Church, VA 22041
## TENTATIVE SCHEDULE FOR THE 2003 - 2005 CODE DEVELOPMENT CYCLE

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All proposed code changes are to be submitted on the Public Proposal Form shown on page vii, to ICC at the following address:

International Code Council, Inc.
5203 Leesburg Pike, Suite 600 XFalls Church, VA 22041-3401
(703) 931-4533
www.intlcode.org
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101.3

Proposed Change as Submitted:

Proponent: Gregory G. Victor, Glendale Fire Department

Revise as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Proponent's Reason: This proposal clarifies that code officials are concerned about the safety of fire fighters and other emergency responders and that many provisions of this code are intended to apply to fire fighter safety during emergency operations

Committee Action: Disapproved

Committee Reason: The language proposed is subjective and the code provides for a minimal level of safety.

Staff Note: The vote on this item was 9 to 8 with the chair making the deciding vote. During the Assembly Section, the chair announced he had been convinced to change his vote.

Assembly Action: Approved as Submitted - Failed

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comments were submitted.

Public Comment 1:

Lawrence A. Rude, City of Renton Fire Department representing City of Renton, requests Approved as Submitted.

Commenter's Reason: The Term reasonable is defined in Webster's New College Dictionary as - "1. Capable of reasoning.: Rational 2. Governed by or in accordance with reason or sound thinking. 3. Within the bounds of common sense. 4. Not extreme or excessive: Fair". The disapproval offered by the committee was that the term reasonable is a problem word. We need to Consider that reasonable is a legal standard and is taught in nearly every American law school and fire inspection class as the root for determining negligence.

There is no new wording being added to this section except the words "fire fighters and emergency responders during emergency operations". The words "a reasonable level" already exists in this section of the Fire Code and in other International code published documents. I would respectfully encourage the approval of this item as submitted based on the fact that all code books and proposals are evaluated on fire fighters and emergency responders operations in addition to their safety.

Public Comment 2:

Rob Geislinger, Parker Fire Protection District representing Fire Marshal's Association of Colorado, requests Approved as Submitted.

Commenter's Reason: Over the past years we have seen a significant decrease in property loss, injuries and fatalities as a result of fire. Unfortunately, despite a decrease in the number of fires, firefighter deaths have remained relatively static, indicating that the number of firefighter deaths per fire is increasing. Why is this? While the codes and standards bodies have done an excellent job in improving public safety we have not adequately addressed the safety of our emergency responders who we expect to protect us from disaster.

As for the first of the committee's published reasons for disapproving this change I would suggest that without the proposed language the requirements addressed - fire lanes, standpipes, basement sprinklers, etc - could easily be interpreted as necessary for property or occupant protection rather than "explicit" firefighter protection requirements. In this case nothing within the code recognizes the value of the first responder.

As for the term "reasonable" it is important to recognize that its occurrence - in both existing and new language - is subordinate when read in context with the paragraph as a whole. "The purpose of this code is to establish the minimum requirements . . .", establishes the specific intent, whereas the rest of the paragraph merely elaborates. Neither the existing language nor the proposed language would allow a code official to arbitrarily enforce requirements beyond the code; to do so, he would have to concede that he is exceeding the minimum requirements specifically established in the Code.

Although firefighters and other emergency responders are generally aware of the hazards they face, it is incumbent upon us as builders, design professionals, industry and code officials to promulgate a code that recognizes these specific hazards, and limits them, where possible.

Public Comment 3:

Greg Rogers, representing Kitsap County Fire District 7, requests Approved as Submitted.

Commenter's Reason: The disapproval offered for the committee is that the term reasonable is a problem word, really is weak when you consider that reasonable is a legal standard and is taught in nearly every American law school and fire inspection class as the root for determining negligence in this country. There is no new wording being added to this section except the words "fire fighters and emergency responders during emergency operations". The words "a reasonable level" already exists in this section of the Fire Code and in other International code published documents. I would encourage the approval of this item as submitted based on the fact that all code books and proposals are evaluated on fire fighters and
emergency responders operations. If operations were not considered in the codes and proposals, than we wouldn’t need requirements for fire department access, fire lanes, fire hydrant systems, or fire protection systems. We certainly could do with out Section 507 of the International Fire Code “Hazards to Fire Fighters”.

**Public Comment 4:**

Jim Tidwell, Fort Worth Fire Department, requests Approved as Submitted.

**Commenter’s Reason:** The Fire Code has many provisions specific to firefighter safety in its content. Without this change in the scope, it could be argued that firefighter safety is outside the scope of the document and, therefore, any provisions related to firefighter safety would be inappropriate for inclusion in the fire code. Furthermore, without this change, providing for firefighter safety would be an inappropriate reason for any code change to be introduced in the future.

This topic is being debated on many levels; particularly, in performance codes, there is a need to specifically reference firefighter safety in the goals to be achieved in the design of a facility. However, the performance codes are looking toward the more entrenched prescriptive codes for guidance. Lacking any reference to firefighter safety in the International Fire Code, some in the performance code arena will argue against provisions to safeguard firefighters. It is interesting to note that, after the debate relating to the floor action to overturn the committee’s recommendation, the committee’s vote actually changed in favor of this item.

The “bottom line” is that everyone has spoken on this issue at the code hearings has agreed that there are provisions in the code that are specifically intended to provide for the safety of firefighters conducting emergency operations at facilities regulated by the code. To NOT provide for this issue in the scope of the document sends an inaccurate signal to the fire service and the design community.

**Public Comment 5:**

Michael G. Kraft, Ohio Division of State Fire Marshal, requests Approved as Submitted.

**Commenter’s Reason:** The proposal merely intends to clarify the intent of the code. It does not institute additional requirements. It is consistent with ICC philosophy according to proponent testimony offered at the public hearing.

**Public Comment 6:**

Gregory Victor, Glendale Fire Department; representing Arizona Fire Marshal’s Association, requests Approved as Modified by this Public Comment.

**Modify proposal as follows:**

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

**Commenter’s Reason:** This proposal clarifies that code officials are concerned about the safety of fire fighters and other emergency responders and that many provisions of this code are intended to apply to fire fighter safety during emergency operations. It must be noted that this is a change to the intent section of the code only and does not impose or require any additional requirements beyond the current parameters of the code. When code officials attempt to interpret, apply and modify provisions of any code it is in the best interests of all involved that there is a complete understanding of what the original intent and purpose of the document was. This proposal simply adds a reference in the intent section in two locations to keep our minds on the intent of the document when we are using it. The IBC General Committee approved this language for inclusion in the intent section of the International Building Code. This proposal essentially codifies current practice.

**Public Comment 7:**

Kevin H. Scott, Kern County Fire Department, requests Approved as Modified by this Public Comment.

**Modify proposal as follows:**

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

**Commenter’s Reason:** This item was disapproved in Pittsburgh because the term “reasonable level” was not removed. Therefore, this public comment proposes to revise the original item, and delete the term “reasonable level”.

The IFC currently considers and provides for emergency personnel safety in many areas of the code. This wording is not a code requirement, but is only a statement of intent. This proposal will clarify that the issue of emergency responder safety is considered in the code. Many provisions of this code are intended to apply to firefighter and emergency response crew safety during emergency operations.

This same issue was heard by the IBC General Committee as Item G2-02. The IBC General Committee voted to Approve as Modified with the revision as proposed above.

**Public Comment 8:**

Gilbert Gonzales, Murray City Corp., representing Utah Chapter ICC, requests Approved as Modified by this Public Comment.

**Modify proposal as follows:**

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

**Commenter’s Reason:** To be consistent with G2-02 approved by the IBC General Committee and to recognize fire fighter and emergency responder safety is and always has been a consideration in the nations model construction codes.

**Public Comment 9:**
Jaksi MacLean, Yakima County Fire Protection Bureau, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Commenter’s Reason: This proposal as modified will be consistent with the language adopted by the International Building Code General Committee. There were comments during IFC floor discussions in Pittsburgh that the language was unnecessary because the need for safety was understood in departments accustomed to emergency operations. Consideration should be given to the fact that not all agencies enforcing the International Fire Code are a part of a fire department. Decision-makers are often aware of the need for safety to building occupants but do not consider those that respond once the building has been evacuated. Inclusion of this language clarifies the fact that requirements of the code are indeed intended to provide for the safety of fire fighters and emergency responders.

Public Comment 10:

Charles Clark, National Concrete Masonry Association representing Masonry Alliance for Codes and Standards, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Commenter’s Reason: We are submitting this Public Comment on Code Change F2-02 to propose a modification so that it can be Approved as Modified during the ICC joint Annual Conference. Then the revised code change will be consistent with a similar code change approved by the IBC General Code Development Committee to revise Section 101.3 Intent of the International Building Code (IBC). In particular, that was Code Change G2-02 which was Approved as Modified. The General Code Development Committee based its approval on the comments, published reason and the modification it made to delete the phrase “a reasonable level of” which the Committee felt was overly broad and could cause inconsistent enforcement as a result. The Committee did agree that the revision to the intent section codifies current practice. The Committee did not feel that the Code Change imposed any additional requirements beyond those already set up in the code but simply clarified the intent to indicate that the code also did address fire fighter and emergency responder safety.

It should also be noted that the ICC Performance Code for Buildings and Facilities (2001) clearly addresses emergency responder safety in Chapter 21 emergency Responder Safety. Since the ICC Performance Code is intended to be an alternate code to the IBC, it follows then that fire fighter/emergency responder safety is part of the purpose of the IBC. Therefore, we urge the voting membership to approve this code change as modified by this Public Comment.

Public Comment 11:

David Saunders, Yakima County Permit Services requests Approved as Modified by this Public Comment.

Modify proposal as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Commenter’s Reason: This proposal as modified will be consistent with the language adopted by the International Building Code General Committee. This proposal is necessary to clarify the fact that the safety of fire fighters and other emergency responders is and has been a consideration in the development of the code provisions. Testimony was given at the code hearings that this was understood without it being said because the need for safety was understood in departments accustomed to emergency operations.

Public Comment 12:

Greg Rogers, representing Washington State Association of Fire Marshal’s, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Commenter’s Reason: This proposal as modified will be consistent with the language adopted by the International Building Code General Committee. I would encourage the approval of this item as submitted based on the fact that all code books and proposals are evaluated on fire fighters and emergency responders operations. If operations were not considered in the codes and proposals, than we wouldn’t need requirements for fire department access, fire lanes, fire hydrant systems, or fire protection systems. We certainly could do with out Section 507 of the International Fire Code “Hazards to Fire Fighters.”

Public Comment 13:

Jim Tidwell, Fort Worth Fire Department, requests Approve as Modified by this Public Comment.

Modify proposal as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.
**Commenter's Reason:** The Fire Code has many provisions specific to firefighter safety in its content. Without this change in the scope, it could be argued that firefighter safety is outside the scope of the document and, therefore, any provisions related to firefighter safety would be inappropriate for inclusion in the fire code. Furthermore, without this change, providing for firefighter safety would be an inappropriate reason for any code change to be introduced in the future.

This topic is being debated on many levels; particularly, in performance codes, there is a need to specifically reference firefighter safety in the goals to be achieved in the design of a facility. However, the performance codes are looking toward the more entrenched prescriptive codes for guidance. Lacking any reference to firefighter safety in the International Fire Code, some in the performance code arena will argue against provisions to safeguard firefighters.

It is interesting to note that, after the debate relating to the floor action to overturn the committee’s recommendation, the committee’s vote actually changed in favor of this item.

The “bottom line” is that everyone has spoken on this issue at the code hearings has agreed that there are provisions in the code that are specifically intended to provide for the safety of firefighters conducting emergency operations at facilities regulated by the code. To NOT provide for this issue in the scope of the document sends an inaccurate signal to the fire service and the design community.

The change to this submittal is consistent with the change approved by the IBC General Committee to the IBC.

**Public Comment 14:**

John Caul, Oregon State Fire Marshal’s Office; representing Oregon Fire Code Committee, requests Approved as Modified by this Public Comment.

**Modify proposal as follows:**

**101.3 Intent.** The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

**Commenter’s Reason:** This proposal as modified will be consistent with the language adopted by the International Building Code General Committee as item G2-02 and should take care of the concerns the committee had about the word “reasonable”. I would encourage the approval of this item as modified based on the fact that many of the provisions of this code are intended to apply to firefighter and emergency response crew safety during operations.

**Public Comment 15:**

Marc Sampson, City of Longmont Fire Department, requests Approved as Modified by this Public Comment.

**Modify proposal as follows:**

**101.3 Intent.** The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

**Commenter’s Reason:** The committee rejected this code change based on the definition of “reasonable” was to broad and subjective. This modification deletes the word reasonable. The text deleted only clarifies the intent section and also correlates with code change G2-02 as modified.

**F4-02**

**102.3, 102.4, 102.5**

**Proposed Change as Submitted:**

**Proponent:** John Terry, Chairperson, ICC International Existing Building Code Drafting Committee

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**1. Revise to read as follows:**

**102.3 Change of use or occupancy.** No change shall be made in the use or occupancy of any structure that would place the structure in a different division of the same group or occupancy or in a different group of occupancies, unless such structure is made to comply with the requirements of this code and the International Building Code and the International Existing Building Code. Subject to the approval of the code official, the use or occupancy of an existing structure shall be permitted to be changed and the structure is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code and the International Building Code, and the International Existing Building Code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

**102.4 (Sup) Application of building code.** The design and construction of new structures additions and alternations shall comply with the International Building Code.

**102.5 (Sup) Historic buildings.** The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall be in accordance with the provisions of the International Existing Building Code, not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures do not constitute a distinct hazard to life or property.

**Proponent’s Reason:** These code changes are submitted to provide correlation between the International Existing Building Code and the International Fire Code. They provide the necessary reference to the IEBC to allow the user to work in and refer to the appropriate codes when inspecting and dealing with existing buildings.

**Committee Action:** Disapproved
Committee Reason: The change will not help the inspector in the field, and will confuse the issue of the mechanism to get the inspector to the proper code.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Terry, State of New Jersey; representing the International Existing Building Code Drafting Committee, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

102.3 Change of use or occupancy. No change shall be made in the use or occupancy of any structure that would place the structure in a different division of the same group or occupancy or in a different group of occupancies, unless such structure is made to comply with the requirements of this code, the International Building Code and the International Existing Building Code. Subject to the approval of the code official, the use or occupancy of an existing structure shall be permitted to be changed and the structure is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code and the International Building Code and the International Existing Building Code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use. The provisions of the International Existing Building Code shall apply to all buildings undergoing a change of occupancy.

102.4 (Supp) Application of building code. The design and construction of new structures shall comply with the International Building Code. Repairs, alterations and additions to existing structures shall comply with the International Existing Building Code.

102.5 (Supp) Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of existing buildings or structures that are designated as historic buildings when such buildings or structures do not constitute a distinct hazard to life or property shall be in accordance with the provisions of the International Existing Building Code.

Commenter’s Reason: This code change was originally Disapproved. The fire code development committee, in their reason, indicated that the original change will not help the inspector in the field and will confuse the issue of the mechanism to get the inspector to the proper code. The International Existing Building Code adequately addresses all repairs, alterations, additions, change of occupancy, historic buildings and move buildings. The IEBC requires compliance with the IBC and IFC as necessary based on the work being done. The IBC General Committee has already approved code change proposal G133, that replaces the current text of 2000 IBC Chapter 34, Existing Structures, with a reference to the IEBC. The development work on the IEBC is complete and the code will be published as part of the family of I-Codes as a part of the 2003 edition. In order to avoid the confusion and possible conflict among different codes requiring different applications all work done to an existing building should be directed to the IEBC.

The IEBC Drafting Committee respectfully requests the membership approval of this public comment (AM).

Analysis: The Proposed Change as Submitted has been modified to reflect errata to the Public Hearing Code Change monograph.

F9-02
105.1.1, 106

Proposed Changes as Submitted:

Proponent: Jakki MacLean/Greg Rogers, Washington State Association of Fire Marshals

Revise as follows:

105.1.1 (Supp) Permits required.  Permits required by this code shall be obtained from the fire code official. Permit fees, if any, shall be paid prior to the issuance of the permit. Issued permits shall be kept on the premises designated therein at all times and shall be readily available for inspection by the fire code official.

SECTION 106 FEES

106.1 Payment of fees. A permit shall not be valid until the fees prescribed by law have been paid nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

106.2 Schedule of permit fees. On buildings, structures, systems, or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

106.3 Work commencing before permit issuance. Any person who commences any work on a building, structure, or system before obtaining the necessary permits shall be subject to an additional fee established by the code official that shall be in addition to the required permit fees.

106.4 Related fees. The payment of the fee for the construction, installation or operation for work done in connection with or concurrent with the work authorized by a fire permit shall not relieve that applicant or holder of the permit from the payment of other fees that are prescribed by law.

106.5 Refunds. The fire code official is authorized to establish a refund policy.

(Renumber existing sections.)
Proponent’s Reason: Many fire code authorities have adopted fee schedules for required permits. Having this language in the body of the code gives the fire code official the ability to site the fee requirements and eliminates the need for local ordinance amendments.

Committee Action: Disapproved

Committee Reason: Permit fee processes need to be done at local level.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment

Jakki MacLean/Greg Rogers, Washington State Association of Fire; representing Yakima County Fire Protection Bureau, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

105.1 (Supp) Permits required. Permits required by this code shall be obtained from the fire code official. Issued permits shall be kept on the premises designated therein at all times and shall be readily available for inspection by the fire code official.

SECTION 106

FEES

106.1 Payment of fees. A permit shall not be valid until the fees prescribed by law have been paid. Nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

106.2 Schedule of permit fees. On buildings, structures, systems, or alterations requiring a permit, a fee for each operational or construction permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

106.3 Work commencement before permit issuance. Any person, who commences any work on a building, structure, or system before obtaining the necessary firm, or corporation that uses a building or premises or engages in any activity for which a permit is required without first having obtained such permit shall be subject to an additional fee established by the applicable governing authority that shall be in addition to the required permit fees.

106.4 Related fees. The payment of the fee for the construction, installation or operation for work done in connection with or concurrent with the work authorized by a fire permit shall not relieve that applicant or holder of the permit from the payment of other fees that are prescribed by law the applicable governing authority.

106.5 Refunds. The fire code official is authorized to establish a refund policy.

(Renumber existing sections.)

Commenter’s Reason: Many fire code authorities have adopted fee schedules for required permits by local ordinance. Having this language in the body of the code gives the fire code official the ability to site fee requirements, address work commencing without a permit, and establish a refund policy without the need to hold a public hearing as required for ordinance modification.

F15-02

105.6.17

Proposed Change as Submitted:

Proponent: Michael G. Kraft, Ohio Division of State Fire Marshal

Revise as follows:

105.6.17 (Supp) Flammable and combustible liquids: An operational permit is required:

1-5 (No change to current text)

6. To install, alter, remove, abandon, place temporarily out of service (for more than 90 days) or otherwise dispose of an underground, protected above-ground or above-ground flammable or combustible liquid tank.

7-8 (No change to current text)

Proponent’s Reason: The proposed change intends to eliminate redundancy and confusion as the installation, alteration, removal or disposal of an underground or aboveground storage tank is also addressed in Section 105.7.5 and should remain under construction permits. The placing of a tank temporarily out of service can be considered operational in nature and should be retained here. (See companion code change for Section 105.7.5.)

Committee Action: Disapproved

Committee Reason: This language proposed to be removed is necessary in the code, F18-02 and F15-02 would need to be looked at together for consideration.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Michael G. Kraft, Ohio Division of State Fire Marshal, requests Approved as Submitted.

Commenter’s Reason: The committee disapproved the proposal merely because its companion change (F18-02) was published as a separate proposal. The committee was in error, because each change, although related, merely eliminates redundant requirements for permits. Therefore, even if the committee approved only one of the changes (the reason for their collective disapproval), there would
have been no holes created in the code. This code change is important to eliminate confusion. Otherwise, to install a tank requires both a construction and operational permit.

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**F17-02**

**105.6.28**

*Proposed Change as Submitted:*

**Proponent:** Bruce Swiecicki, National Propane Association (NPGA)

**Revise as follows:**

105.6.28 LP-gas. An operational permit is required for:

1. Storage and use of LP-gas operations in which cargo tank motor vehicles or trucks used for transporting cylinders are loaded for wholesale or retail distribution.

   **Exception:** A permit is not required for individual containers with a 500-gallon (1893 L) water capacity or less serving occupancies in Group R-3.

2. Operation of cargo tankers that transport LP-gas. Dispensing LP-gas from stationary containers into motor vehicles or portable cylinders.

**Proponent’s Reason:** The purpose of this proposed change is to revise the code to address a number of inconsistencies. The reasons are as follows:

1. Operational permits, as defined in Section 105.1.2, are intended to allow an applicant to “conduct an operation or a business...” As such, the current text within Item 1 is inaccurate, because it includes within its scope many installations which are neither “operations” or “businesses”. For example, customers with storage tanks used to fuel heating, cooking, water heating and clothes drying appliances are not necessarily “businesses” or “operations,” but are required to apply for that type of permit. These installations are the same as installations using natural gas or electricity utility service, and should not be treated as though they are different.

2. Item 2 addresses the operation of cargo tank motor vehicles and, as explained in a proposal to Section 3801.1, falls outside the scope of this code as defined in Section 101.

3. The proposed text would require those LP-gas installations which involve a high number of product transfer operations between stationary storage containers and other containers to comply with the operational permitting requirements. This is a natural fit because the hazard associated with LP-gas installations is not due to the storage of the product, but to the transfer of product between containers, where hose connections are being made frequently and the potential for product release increases.

**Committee Action:** Disapproved

**Committee Reason:** The existing code is clear and the change is not needed.

**Assembly Action:** No Motion

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**F18-02**

**105.7.5**

*Proposed Change as Submitted:*

**Proponent:** Michael G. Kraft, Ohio Division of State Fire Marshal

**Revise as follows:**

105.7.5 Flammable and combustible liquids. A construction permit is required:

1-2 Unchanged.

3. To install, alter, remove, abandon, place temporarily out of service or otherwise dispose of a flammable or combustible liquid tank.

**Proponent’s Reason:** The proposed change is intended to eliminate redundancy and confusion as the placing of a tank temporarily out of service is adequately addressed under operational permits (see companion code change under Section 105.6.17, No. 6).

**Committee Action:** Disapproved

**Committee Reason:** Based on previous action with F15-02.

**Assembly Action:** No Motion

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This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Bruce Swiecicki, National Propane Gas Association, requests Approved as Submitted.

**Commenter’s Reason:** Looking at the published “Committee Reason,” it is obvious the Code Committee failed to understand that the current text of 105.6.28 requires the “storage and use” of LP-gas to be treated as “an operation or business,” which is how “operational permits” are defined in Section 105.1.2. Over 5 million building owners store and use LP-gas for space heating, water heating, cooking and clothes drying. To require them to pull an operational permit for using LP-gas in this manner is ridiculous.

The proposed text will justifiably require operational permits for LP-gas operations that involve loading and unloading cargo tank motor vehicles, as well as dispensing operations.

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2002 ICC FINAL ACTION AGENDA
Michael G. Kraft, Ohio Division of State Fire Marshal, requests Approved as Submitted.

Commenter’s Reason: The committee disapproved the proposal merely because its companion change (F15-02) was published as a separate proposal. The committee was in error, because each change, although related, merely eliminates redundant requirements for permits. Therefore, even if the committee approved only one of the changes (the reason for their collective disapproval), there would have been no holes created in the code. This code change is important to eliminate confusion. Otherwise, to place a tank temporarily out of service requires both a construction and operational permit.

F19-02
105.7.8

Proposed Change as Submitted:

Proponent: Bruce Swiecicki, National Propane Association (NPGA)

Revise as follows:

105.7.8 LP-gas. A construction permit is required for installation of or modification to an LP-gas system not within the scope of the International Fuel Gas Code®.

Exception: A permit is not required for individual containers with a 500-gallon water capacity or less serving occupancies in Group R-3.

Propponent’s Reason: The purpose of this proposed change is to achieve consistency between the International Fuel Gas Code® and the International Fire Code®. The reasons for the change are as follows:

1. Section 106 of the International Fuel Gas Code® already requires permits for LP-gas fuel systems which are within the scope of that code. Typically, this would include all portions of a fuel gas distribution system which are installed downstream of the second stage regulator (14 in. Water column outlet). This means that flue gas piping within a building and all appliances would be covered by the IFGC®.

2. Those portions of the system which are upstream of the second stage regulator (the tank and outside piping) would be addressed by the International Fire Code®. The 500 gallon water capacity threshold in the exception has been moved from existing Section 105.6.28 to a more appropriate location.

3. The current text would require permits for such things as servicing appliances, which are clearly outside the intended application of this section.

Committee Action: Disapproved

Committee Reason: The language proposed for deletion is needed to keep fire service aware of propane installations.

Assembly Action: No Motion

Individual Consideration Agenda:

The item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bruce Swiecicki, National Propane Gas Association, requests Approved as Submitted.

Commenter’s Reason: This change is needed to avoid duplicate permitting requirements for space heating, water heating, cooking and clothes drying installations fueled by propane. The International Fuel Gas Code already requires permits for fuel gas systems within buildings.

The proposed exception will still require permits for tank installations (upstream of the second stage regulator) except for small residential systems.

F20-02
107.5, 202

Proposed Change as Submitted:

Proponent: Michael G. Kraft, Ohio Division of State Fire Marshal

1. Revise as follows:

107.5 Owner/occupant responsibility. Correction and abatement of violations of this code shall be the responsibility of the owner. If an occupant creates, or allows to be created, hazardous conditions in violation of this code, the occupant shall be held responsible for the abatement of such hazardous conditions. Any person representing the actual owner shall be bound to comply with the provisions of this code to the same extent as if that person was the owner.

2. Revise as follows:

SECTION 202
GENERAL DEFINITIONS

AGENT. A person who shall have charge, care or control of any structure as owner, or agent of the owner, or as executor, executrix, administrator, administratrix, trustee or guardian of the estate of the owner. Any such person representing the actual owner shall be bound to comply with the provisions of this code to the same extent as if that person was the owner.

Proponent’s Reason: 1. Adding the text to Section 107.5 as proposed keeps the information as currently prescribed in the code but is intended to merely relocate it from the definitions chapter to this section on owner responsibility. (See companion code change to Section 202–Agent.)

2. This portion of the definition should be deleted because it is not utilized to define the term, but rather, the text places
requirements on persons acting as an “agent” which is the defined term. This section of text should be relocated to Section 107.5 of the Administrative Chapter where requirements and owner or agent responsibilities should be located. See companion code change for Section 107.5.)

Committee Action: Disapproved

Committee Reason: The code change would place responsibility on a person other than the owner.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Michael G. Kraft, Ohio Division of State Fire Marshal; requests Approved as Modified by this Public Comment.

Modify proposal as follows:

107.5 Owner/Occupant Responsibility. Correction and abatement of violations of this code shall be the responsibility of the owner or agent. If an occupant creates, or allows to be created, hazardous conditions in violation of this code, the occupant shall be held responsible for the abatement of such hazardous conditions. Any person representing the actual owner shall be bound to comply with the provisions of this code to the same extent as if that person was the owner.

2. Revise as follows:

AGENT. A person who shall have charge, care or control of any structure as owner, or agent of the owner, or as executor, executrix, administrator, administratrix, trustee or guardian of the estate of the owner.

Commenter’s Reason: The code change merely intended to remove a requirement from a definition and place the requirement into the code text, not to create additional requirements on additional parties. The testimony and committee comments indicated that merely extracting the text from the definition and placing in Section 107.5 created additional problems. Therefore, the modification proposed here accomplishes the same thing but in a much simpler fashion.

F21-02

107.6

Proposed Change as Submitted:

Proponent: Paul Hayward, City of Farmington, UT

Revise as follows:

107.6 (Supp) Overcrowding. No person shall permit overcrowding or admittance of any person beyond the approved capacity of a building or a portion thereof shall not be allowed. The fire code official, upon finding any overcrowding conditions or obstructions in aisles, passageways or other means of egress, or upon finding any condition which constitutes a life safety hazard, shall be authorized to cause the performance of presentation, spectacle or entertainment event to be stopped until such condition or obstruction is corrected.

Proponent’s Reason: Eliminates the possible confusion and/or liability of “any or no” person. Simply stated, when the fire code official finds a serious violation it is permissible to obtain abatement of the hazard. Continuation of the event is conditional upon compliance. It is advisable to say “event” rather than try and list all possible words that might describe such a gathering. This is a straightforward requirement that cannot be misunderstood.

Committee Action: Disapproved

Committee Reason: The code change would confuse the issue of overcrowding more than clarify it.

Assembly Action: Approved as Submitted - Failed

Individual Consideration Agenda:

This item is on the agenda for individual consideration because public comments were submitted:

Public Comment 1:

Paul Hayward, City of Farmington, Utah; requests Approved as Submitted.

Commenter’s Reason: The provision is needed, but the original wording will create enforcement problems. If we start down the path of saying “No person . . .” how many more provisions must we include to make the code work? The committee vote was tied and the chairman cast the deciding vote for disapproval. When asked what he found objectionable he couldn’t remember immediately and stated he would need to check his notes. The assembly vote garnered a majority of those in the room =-52-31 in favor, which was 63%. Unfortunately under the present rules 2/3 is needed to generate a public comment from assembly action. This proposal is better than the original and should be approved by the membership.

Public Comment 2:

Ron Ivie, Park City, Utah, representing Utah Chapter ICC, requests Approved as Submitted.

Commenter’s Reason: Proposed language is much clearer. The simple test is to read both the exiting and the new. Make your own judgement.

F25-02

202
**Proponent:** Michael G. Kraft, Ohio Division of State Fire Marshal

**Revise as follows:**

SECTION 202 DEFINITIONS

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

Proponent’s Reason: The definition for “code official” in International Fire Code® 2000 contained the additional examples of a fire code official proposed here. The 2001 Supplement dropped this text but F6-00 only added the word fire to the term code official.

Committee Action: Disapproved

Committee Reason: The code change is already covered in other sections of the code.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Michael G. Kraft, Ohio Division of State Fire Marshal, requests Approved as Submitted.

Commenter’s Reason: Code change F6-00 only added the word fire to code official. The definition for “code official” in IFC 2000 contains these additional examples of “code official”. The committee disapproved the change based on redundancy. There are many circumstances where the fire marshal or code enforcement official is not the fire chief.

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**F26-02**

202

**Proponent:** Michael G. Kraft, Ohio Division of State Fire Marshal

Add new text as follows:

SECTION 202 GENERAL DEFINITIONS

FIRE HAZARD. Any thing or act increasing or causing an increase of the hazard or menace of fire to a greater degree than that customarily recognized by persons in the public service who are regularly engaged in preventing, suppressing or extinguishing a fire, or which will obstruct, delay, hinder or interfere with the operations of the fire department or the egress of occupants in the event of a fire.

Proponent’s Reason: The term fire hazard is utilized throughout the code (e.g., Sections 311.2.2, 406.3.1, 603.6, 603.7, 603.8.3, etc.). The term becomes a defining characteristic that triggers the application of many requirements. Enforcement of the code teaches us that the code user would benefit from the term being provided with a definition in the code.

Committee Action: Disapproved

Committee Reason: The language in the code change is ambiguous and not good code language.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Michael G. Kraft, Ohio Division of State Fire Marshal, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

SECTION 202 GENERAL DEFINITIONS

Fire Hazard. Any thing or act increasing or causing an increase of the hazard or menace of fire to a greater degree than that customarily recognized by persons in the public service who are regularly engaged in preventing, suppressing or extinguishing a fire, or which will obstruct, delay, hinder or interfere with the operations of the fire department or the egress of occupants in the event of a fire circumstance, situation, thing, or action that creates exposure to fire loss or the assumption of a risk, danger, or peril from fire.

Commenter’s Reason: The committee agreed with the intent of the proposal, that a definition of the term fire hazard may be helpful to the code user. The term is utilized throughout the code. However, the committee disapproved the proposed change, agreeably so, due to a number of problems pointed out at the public hearing. Therefore, the definition has been modified in accordance with the concerns expressed at public hearing. The definition proposed in this comment is based in part on the definition of “hazard” found in “Blacks Law Dictionary”.

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**F30-02**

302.1

Proposed Change as Submitted:
Proponent: Michael G. Kraft, Ohio Division of State Fire Marshal

Revise as follows:

SECTION 302
DEFINITIONS

302.1 Definitions

RECREATIONAL FIRE. An outdoor fire burning materials other than rubbish where the fuel being burned is not contained in an incinerator, outdoor fireplace, barbecue grill or barbecue pit and has a total fuel area of 3 feet (914 mm) or less in diameter and 2 feet (610 mm) or less in height for pleasure, religious, ceremonial, cooking, warmth or similar purposes.

Proponent’s Reason: An outdoor fireplace or chiminea is indeed considered to be a recreational fire and therefore the language needs to be struck. Under Section 307.3, an outdoor fireplace would best be considered a recreational fire, thus it should not be excluded from the definition.

Committee Action: Disapproved
Committee Reason: The code change would lose information needed for clarity and definition.

Assembly Action: No Motion

Individual Consideration Agenda:

The item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Michael G. Kraft, Ohio Division of State Fire Marshal, requests Approved as Submitted.

Commenter’s Reason: The committee appeared to agree that an outdoor fireplace is a recreational fire yet disapproved the code change. Presumably, because the term outdoor fireplace is proposed to be stricken and it may be perceived as eliminating it from the definition. Conversely, the current text excludes outdoor fireplaces from the definition of a recreational fire.

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304.4 Combustible Mulch. Combustible mulch shall not be applied or maintained within 24 inches (610 mm) of a building’s exterior perimeter.

Exceptions:
1. One and two family dwellings.
2. Buildings with exterior walls and wall coverings of noncombustible materials.

Proponent’s Reason: Many fires in mulch are caused by carelessly discarded smoking materials. Mulch has been found to be applied against or in close proximity to combustible wall coverings or combustible construction. The fire spreads to the building from the mulch. In many cases the smoldering fires go undetected for quite some time. By establishing the two feet clearance, the risk of fire loss from a mulch fire transmitting to the building is minimized.

Staff Analysis: No fire loss data on the use of mulch has been submitted in support of this proposed code change.

Committee Action: Disapproved
Committee Reason: The code change did not provide supporting data and may need to be dealt with at the local level for specific areas within the jurisdiction.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Trotter, Chairman representing SBCCI IBC Fire Safety Code Action Committee, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

304.4 Combustible Mulch. Combustible mulch and similar materials shall not be applied or maintained within 24 inches (610 mm) of a building’s exterior perimeter.

Exceptions:
1. Detached one and two-family dwellings.
2. Buildings with exterior walls and wall coverings of noncombustible materials.

Commenter’s Reason: This proposal is clearly in accordance with the scope and intent of the IFC. Modifications have been made for the original proposal that address the committee comments at the hearings. The city of Franklin, Tennessee has lost over 1 million dollars in property damage as a direct result of mulch fires. The Board of Mayor and Alderman approved the original text indicated above as a municipal ordinance because the health, safety, and welfare of the citizens required it.

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F33-02
304.4 (New)

Proposed Change as Submitted:

Proponent: Walter “Butch” Simmons, SBCCI IBC Fire Safety Code Action Committee

Add new text as follows:

F34-02
308.3.5, Chapter 45
Proposed Change as Submitted:

Proponent: Michael G. Kraft, Ohio Division of State Fire

1. Revise as follows:

308.3.5 Theatrical performances. Where approved, ope-flame devices sued in conjunction with theatrical performances are allowed to be used when adequate safety precautions have been taken in accordance with NFPA 160.

2. Add new reference standard to Chapter 45 as follows:

NFPA 160-01 Flame Effects Before an Audience

Proponent’s Reason: The code change proposes to add a reference to the appropriate NFPA standard to afford the fire code official essential guidance in the approval of these situations and their inherent hazards.

Committee Action: Approved as Submitted

Committee Reason: This code change addresses the hazard and provides the reference document to use.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gilbert Gonzales, Murray City Corp, representing Utah Chapter ICC, requests Disapproved.

Commenter’s Reason: There are other methods that the fire official can use in addition to NFPA 160 which are also appropriate. This code change would limit the fire official to using NFPA 160 exclusively. It was unclear to me at the hearing if NFPA 160 was a standard which met the ICC reference standard criteria.

F36-02 308.6 (New)

Proposed Change as Submitted:

Proponent: Gregory G. Victor, Glendale Fire Department, Arizona

Add new text as follows:

308.6 Flaming Food and Beverage Preparation. The preparation of flaming foods or beverages in places of assembly and drinking or dining establishments shall be in accordance with Section 308.6.

308.6.1 Dispensing. Flammable or combustible liquids used in the preparation of flaming foods or beverages shall be dispensed from one of the following:

1. A 1-ounce (29.6 ml) container or

2. A container not exceeding 1-quart (946.5 ml) capacity with a controlled-pouring device that will limit the flow to a 1-ounce (29.6 ml) serving.

308.6.2 Containers not in use. Containers shall be secured to prevent spillage when not in use.

308.6.3 Serving of flaming food. The serving of flaming foods or beverages shall be done in a safe manner and shall not create high flames. The pouring, ladling or spooning of liquids is restricted to a maximum height of 8 inches (203 mm) above the receiving receptacle.

308.6.4 Location. Flaming foods or beverages shall be prepared only in the immediate vicinity of the table being serviced. They shall not be transported or carried while burning.

308.6.5 Fire protection. The person preparing the flaming foods or beverages shall have a wet cloth towel immediately available for use in smothering the flames in the event of an emergency.

Proponent’s Reason: These regulations are necessary to give the code official the necessary guidance to allow flaming food and beverage preparation to exist in restaurants. Many popular dishes use this method of preparation including locating the preparation at the tableside. These proposed regulations come from the 1997 edition of the Uniform Fire Code®.

Committee Action: Disapproved

Committee Reason: The code change has problems with the amounts allowed and measurement of those amounts.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:
Gregory Victor, Glendale Fire Department, representing Arizona Fire Marshal’s Association, requests Approved as Submitted.

Commenter’s Reason: These regulations are necessary to give the code official needed guidance to allow flaming food and beverage preparation to be conducted in restaurants in a safe manner. Many restaurants prepare selected dishes in this manner and usually at the tableside within close proximity to the customers. This process typically includes the use of a small amount of flammable or combustible liquids and regulation of this process is appropriate. This proposal provides some simple provisions to safely allow this activity. This language was in the 1997 UFC and is proposed here for your consideration.

F39-02
311.2.2

Proposed Change as Submitted:

Proponent: Greg Rogers, Washington State Association of Fire Marshals

Revise as follows:

311.2.2 Fire protection. Fire alarms, sprinkler and standpipe systems shall be maintained in an operable condition at all times.

Exceptions:

1. When the premises have been cleared of all combustible materials and debris and when an automatic fire sprinkler system is not required for excessive height or area limitations and, in the opinion of the code official, the type of construction, fire separation distance and security of the premises do not create a fire hazard.

2. Where buildings will not be heated and fire protection systems will be exposed to freezing temperatures, and the building has no contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized person, the fire alarm and sprinkler systems are permitted to be placed out of service wet standpipes are permitted to be maintained as dry systems (without an automatic water supply) provided the building has no contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized persons.

3. Where the building has no contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized persons, then fire alarm systems that are not monitoring automatic sprinkler systems may be placed out of service.

Proponent’s Reason: In exception #1 automatic fire sprinkler systems that were installed in buildings that were construction of height and area greater than the general building height and area limitations established in the building code should be maintained since they were installed to protect the building not the occupancy. If vacant, the excessive height and area still exist and need protection.

In exception #2 freezing temperatures often need modification of systems to deal with the practical. However dry systems only need a heated sprinkler riser room and should be maintained. Wet systems should be modified to provide protection to buildings over height and area limitations. These structures are large and need continued protection. The cost of converting and heating a riser room is minimal compared to losing the entire protection of the buildings.

Exception #3 is to address fire alarm systems, such as in vacant apartment buildings. The system is intended to warn occupants and as long as the building is maintained vacant they should be allowed to be shut off. However, it does not allow a fire alarm monitoring a required sprinkler system to be shut off.

Committee Action: Disapproved

Committee Reason: The code change provides for enforcement that is already in the code, and therefore not necessary.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Greg Rogers, Washington State Association of Fire Marshal’s, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

311.2.2 Fire protection. Fire alarm, sprinkler and standpipe systems shall be maintained in an operable condition at all times.

Exceptions:

1. When the premises have been cleared of all combustible materials and debris and when an automatic fire sprinkler system is not required for excessive height or area limitations and, in the opinion of the code official, the type of construction, fire separation distance and security of the premises do not create a fire hazard.

2. Where buildings will not be heated and fire protection systems will be exposed to freezing temperatures, and the building has no contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized person, the fire alarm and sprinkler systems are permitted to be placed out of service wet standpipes are permitted to be maintained as dry systems (without an automatic water supply) provided the building has no contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized persons.

3. Where the building has no contents or storage, and windows, doors and other openings are secured to prohibit entry by
standpipes are permitted to be maintained as dry systems (without an automatic water supply).
3. Where the building has no contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized persons, then fire alarm systems that are not monitoring automatic sprinkler systems may be placed out of service.

Commenter’s Reason: The statement given by the committee for disapproval was that language currently exists in the code, and therefore not necessary. The current language in code only covers types of construction. This language does not cover excessive height or area limitations allowed by the building code. Therefore, I would ask that you overturn the committee’s action and approve this item as modified.

In exception #1 automatic fire sprinkler systems that were installed in buildings that were constructed of height and area greater than the general building height and area limitations established in the building code should be maintained since they were installed to protect the building not the occupancy. If vacant, the excessive height and area still exist and need protection.

In exception #2 remains unchanged.

Exception #3 is intended to warn occupants and as long as the building is maintained vacant they should be allowed to be shut off. However, it does not allow a fire alarm monitoring a required sprinkler system to be shut off.

F40-02
313, 315.2.5

Proposed Change as Submitted:

Proponent: Gregory G. Victor, Glendale Fire Department, AZ

1. Delete and substitute as follows:

SECTION 313
FUELED EQUIPMENT

313.1 Vehicle storage. Vehicles powered by flammable liquids, Class II combustible liquids, or compressed flammable gases shall not be stored within the living space of Group R buildings and shall be separated from other uses in accordance with the International Building Code®.

Exceptions:
1. Use of LP-gas powered floor maintenance machines in accordance with Section 8-4 of NFPA 68 shall not be prohibited.
2. The storage of liquid- or gas-fueled appliances, tools, apparatus, craft or vehicles is allowed in Group R buildings provided the following conditions are met:
   2.1. The batteries shall be disconnected.
   2.2. Fuel in the fuel tanks shall not exceed one-fourth of tank capacity or 5 gallons (19 L), whichever is less.
   2.3. Fuel tanks shall be closed and sealed.

2. Delete without substitution:

315.2.5 Fueled equipment. Fueled equipment, including but not limited to motorcycles, mopeds, lawn-care equipment and portable cooking equipment, shall not be stored, operated or repaired within a building.

Exceptions:
1. Buildings or rooms constructed for such use in accordance with the International Building Code®.
2. Where allowed by Section 313 or 314.

315.2.5.1 Removal. The code official is authorized to require removal of fueled equipment from locations where the presence of such equipment is determined by the code official to be hazardous.

313.2 Group R Occupancies. Vehicles powered by flammable liquids, Class II combustible liquids, or compressed flammable gases shall not be stored within the living space of Group R buildings and shall be separated from other uses in accordance with the International Building Code®.

2. Delete without substitution:

315.2.5 Fueled equipment. Fueled equipment, including but not limited to motorcycles, mopeds, lawn-care equipment and portable cooking equipment, shall not be stored, operated or repaired within a building.

Exceptions:
1. Buildings or rooms constructed for such use in accordance with the International Building Code®.
2. Where allowed by Section 313 or 314.

315.2.5.1 Removal. The code official is authorized to require removal of fueled equipment from locations where the presence of such equipment is determined by the code official to be hazardous.

Proponent’s Reason: This proposal deletes the exceptions to Section 313.1 and moves the contents of section 315.2.5 to Section 313. Since both of these sections deal with fueled equipment it makes sense for them to be in the same section. Fueled equipment is certainly not “miscellaneous combustible materials storage” which is the title of Section 315. At the last meeting the membership made it clear that they felt they needed the language in both of these sections. However the existing exceptions to Section 313 negated what the section was trying to accomplish which is to not allow fueled vehicles to be stored inside the living space of a residential occupancy. Removing the exceptions accomplishes that mission.

Committee Action: Disapproved
Committee Reason: The code change needs additional work as it confuses the issue of fueled equipment in buildings.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory Victor, Glendale Fire Department, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

**SECTION 313**

**FUELED EQUIPMENT**

313.1 Fueled equipment. Fueled equipment, including but not limited to motorcycles, mopeds, lawn-care equipment and portable cooking equipment, shall not be stored, operated or repaired within a building.

Exceptions:
1. Buildings or rooms constructed for such use in accordance with the International Building Code.
2. Where allowed by Section 313 or 314.

313.1.1 Removal. The fire code official is authorized to require removal of fueled equipment from locations where the presence of such equipment is determined by the code official to be hazardous.

313.2 Group R Occupancies. Vehicles powered by flammable liquids, Class II combustible liquids, or compressed flammable gases shall not be stored within the living space of Group R buildings and shall not be separated from other uses in accordance with the International Building Code.

Commenter’s Reason: The committee’s reason for disapproval of this proposal states “The code change needs additional work as it confused the issue of fueled equipment in buildings”. What could be more confusing than the original Section 313? This section is purported by those who defend it as necessary in order to keep motorcycles out of the living areas of Group R Occupancies. This is a good goal, except that if one applies the exceptions to 313 one can still keep their motorcycle in the residence as long as the battery is disconnected, there is no more than 5 gallons of fuel or ¼ of capacity of the fuel tank, and the fuel tank is closed and sealed. How do we regulate that? Those exceptions seem to override the original goal. In addition the first exception relates to LP powered floor buffers which are commercial equipment not generally used in a residential setting. In addition, the storage of propane in buildings is regulated by Chapter 38 and NFPA 58 and would be prohibited inside a group R further confusing the issue. In other words, in my opinion, this section makes no sense. Section 315 is improperly located under Miscellaneous Combustible Materials Storage.

This proposal attempts to maintain the provisions of 315 and include the intended prohibition that fueled vehicles are not allowed to be stored inside Group R Occupancies. This is attempted by deleting outright Sections 315 and 315.2.5 and moving those regulations to a new Section 315. A couple of modifications have been made in an attempt to clarify and make less confusing these requirements.

Section 313.1 Fueled Equipment contains the same text as in deleted Section 315.2.5 including the exceptions.

Section 313.1.1 Removal contains the same text as the deleted Section 315.3.5.1

Section 313.2 Group R Occupancies contains the relevant text from Section 313.1 necessary to accomplish the purported goal by providing specific language.

Section 314 is not included in this proposal since it deals with indoor displays and not storage or repairs.

This proposal is presented to the membership for your review. I urge you to vote to include these revisions into the 2003 edition.

F44-01
403.1

Proposed Change as Submitted:

**Proponent:** Fire Chief Jackie Gibbs, Southeastern/Southwestern Association of Fire Chiefs Code Committee; representing SBCCI Code Action Committee

Revise as follows:

403.1 General. When, in the opinion of the fire code official, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest of activity, the owner, agent or lessee shall provide one or more qualified persons, as required and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted. Before each performance or the start of such activity, these personnel shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for extinguishment of fires that occur and assist in the evacuation of the public from the structures.

403.1.1 (Supp) General. In other than Group A or E occupancies, where the fire code official determines that an indoor or outdoor gathering of persons has an adverse impact on public safety through diminished access to buildings, structures, fire hydrants and fire apparatus access roads or where such gatherings adversely affect public safety services of any kind, the fire code official shall have the authority to order the development of, or prescribe a plan for, the provision of an approved level of public safety.

403.3.1.2 Contents. The public safety plan, where required by 403.1.1, shall address such items as emergency vehicle ingress and egress, fire protection, emergency medical services, public assembly areas and the directing of both
owners, lessees or party responsible for the condition of the property where an event may be occurring. The "operator", "agent", or "lessee" is currently found in Chapter 1 to describe those persons who may be responsible for a code non-compliance.

Public Comment 3:

Kevin H. Scott, Kern County Fire Department, representing American Hotel & Lodging; requests Approved as Modified by this Public Comment.

Modify proposal as follows:

403.1 General. When, in the opinion of the fire code official, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the owner, agent or lessee shall provide one or more qualified persons, at require and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted. Before each performance or the start of such activity, the owner, agent, or lessee shall provide one or more approved, qualified person(s) to be on duty during any activity being conducted when, in the opinion of the fire code official, it is essential for public safety in a place of assembly or any other place where people congregate. Such person(s) shall be on duty when the number of persons in attendance, or the nature of the performance, exhibition, display, contest or activity make it essential. Such person(s) shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for extinguishment of fires that occur and assist in the evacuation of the public from any structures.

Commenter's Reason: We suggest that the second sentence would be more clearly understood and enforceable if it were reworded as follows: As currently approved, the first sentence of this section is almost impossible to comprehend. The fundamental requirement is for the owner (or others) to provide the person(s) necessary to monitor the range of possible situations. Secondly, guidance is given as to when it is necessary. Finally, the code indicates what the person(s) is supposed to do. By restating this section everyone can understand the means and method for compliance.

The second sentence as currently approved is contradictory and inconsistent. It begins by saying "before each performance or the start of activity" and then proceeds to say that the personnel must be "diligent ... during the time the place is open to the public or such activity is being conducted." Presumably the "personnel" are the same person mentioned earlier, but what are they to do; work before the activity, or during the time that the activity is taking place? It isn't clear what diligence prior to the activity would do, but obviously if they are there when the activity is taking place that is a threat to public safety they can perform the duties prescribed.

Sarah A. Rice, Schirmer Engineering Corp, representing American Hotel & Lodging; requests Approves ad Modified by this Public Comment.

Modify proposal as follows:

403.1 General. When, in the opinion of the fire code official, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest of activity, the owner, operator, agent, or lessee or party responsible for the condition or event shall provide one or more qualified persons, as required and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted. Before each performance or the start of such activity, these personnel shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for extinguishment of fires that occur and assist in the evacuation of the public from the structures.

403.1.1 (Supp) General. (Unchanged)

403.3.1.2 Contents. (Unchanged)

Commenter's Reason: The proposed modification is intended only to clarify who is to provide the "qualified persons." The term "operator" is typically used in the hospitality industry to identify who is in charge of the property or where an event may be occurring. The phrase "party responsible for the condition" is currently found in Chapter 1 to describe those persons who may be responsible for a code non-compliance.

Public Comment 3:

Kevin H. Scott, Kern County Fire Department, representing American Hotel & Lodging; requests Approved as Modified by this Public Comment.

Modify proposal as follows:

403.1 General. When, in the opinion of the fire code official, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the owner, agent, or lessee shall provide one or more qualified persons, as required and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted. Before each performance or the start of such activity, these personnel shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for extinguishment of fires that occur and assist in the evacuation of the public from any structures.
on duty during the times such places are open to the public, or when such activity is being conducted. Before each performance or the start of such activity, these The fire watch personnel shall keep diligent watch for fires, obstructions to means of egress and other hazards during the time such place is open to the public or such activity is being conducted and take prompt measures for remediation of hazards, extinguishment of fires that occur and assist in the evacuation of the public from the structures.

403.1.1 (Supp) General. (Unchanged)

403.3.1.2 Contents. (Unchanged)

Commenter’s Reason: This public comment accomplishes three things:
1. There is editorial correction to change “of” to “or”.
2. The proposal inserts a defined term in the code, and eliminates the undefined term of “qualified person”. The term “fire watch” is currently used in the code and is a defined term. As defined in the code, the duties of the fire watch personnel are the same as prescribed in this new section.
3. The phrase in the last sentence is deleted for several reasons. First, it does not fit grammatically into the sentence and is confusing because the duties of this personnel do not only exist before the performance/event. The sentence is clarified when the phrase is deleted. Also, the fire watch personnel are expected to react to other hazards besides fire. Therefore, language is added to include other duties which are still part of the fire watch defined duties.

F53-02
604.1.1

Proposed Change as Submitted:

Proponent: John Taecker, Underwriters Laboratories Inc

Revise as follows:

604.1.1 Stationary generators. Emergency and standby power generators shall comply be listed in accordance with UL 2200.

Proponent’s Reason: This is an editorial change to match the language with IBC 2702. The Code Development Committee at the hearings in Portland indicated this change would be made editorially to the IFC.

Committee Action: Approved as Submitted

Committee Reason: The code change adds the proper code language for the reference. And correlates with the IBC Chapter 27 and code change F131-01.

Assembly Action: No Motion

Individual Consideration Agenda: This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, International Code Consultants, representing The Chlorine Institute; requests Approved as Modified by this Public Comment.

Modify proposal as follows:

604.1.1 Stationary generators. Stationary emergency and standby power generators required by this code shall be listed in accordance with UL 2200.

Commenter’s Reasons: Two modifications are proposed. First, the term “stationary” is added to the text of the section to agree with the title, recognizing that titles are not legally enforceable as a limitation on code text which follows. This change is believed to be editorial.

The second revision limits application of this section to those cases where the fire code requires a standby or emergency power source and the means of compliance with this requirement is a generator. It is not evident why a generator that is voluntarily provided by an owner for reasons other than code-required safety systems should have to comply with UL 2200. Such generators are commonly installed by industry as a means of preventing interruption of a process or as a means of maintaining power to computer equipment related to the business. Lacking a safety-related basis demonstrating a need for mandating UL 2200 compliance for non-required generators, the proposed modification is warranted.

F67-02
804.1.1

Proponent: Steven Rocklin, State of New York, Department of State, Division of Code Enforcement; representing State of New York, Department of State, Division of Code Enforcement; Jody Nolan, New York State Fire Marshal & Inspector Association; representing New York State Fire Marshal & Inspector Association; Tom DeMint, Poudre Fire Authority; representing Poudre Fire Authority

Revise as follows:

804.1.1 Restricted occupancies. Natural cut trees shall be prohibited in Group A, E, I-1, I-2, I-3, I-4, M, R-1, R-2 and R-4 occupancies.

Exceptions:
1. Trees located in areas protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or Section 903.3.1.2 shall not be prohibited in Groups A, E, M, R-1 and R-2.
2. Trees shall be permitted within dwelling units in Group R-2 occupancies.

Proponent’s Reason: The language of the exception to Section 804.1.1 would permit natural cut trees in Group R-2 occupancy only where the area is protected by an automatic sprinkler system. A strict interpretation of this language would require that code officials prohibit residents from displaying natural cut trees within dwelling units not protected by sprinklers. Such a prohibition constitutes an undue interference with traditional practices and is impractical and
unenforceable without excessive enforcement efforts on the part of code official.

Committee Action: Approved as Submitted

Committee Reason: The code change allows for residential use in areas, which are not public or common areas.

Assembly Action: Disapproved - Passed

Individual Consideration Agenda:
This item is on the agenda because an assembly action was successful.

F74-02
901.2

Proposed Change as Submitted:

Proponent: Gregory G. Victor, Glendale Fire Department

Revise as follows:

901.2 (Supp) Construction documents. The fire code official shall have the authority to require Complete construction documents and calculations for all fire protection systems shall be submitted for review and approval, in the form required by the code official and containing such data as required by the fire code official, prior to and to require permits be issued for the installation, rehabilitation or modification of any fire protection system. Construction documents for fire protection systems shall be submitted for review and approval prior to system installation.

Proponent’s Reason: Section 104.2 already gives the code official the authority to require construction documents and permits and does not need to be repeated. This proposal section simply requires that those construction documents, and all related calculations, be submitted in accordance with the requirements of the code official before any work is started.

Committee Action: Disapproved

Committee Reason: The code change would take flexibility away from the fire code official.

Assembly Action: No Motion

Public Comment 1:

Paul Hayward, City of Farmington, Utah, representing Farmington City; requests Approved as Submitted.

Commenter’s Reason: The proposal is better than the section as now written. The phrase “…shall have the authority to require…” is cumbersome and awkward. This change makes good sense.

Public Comment 2:

Gilbert Gonzales, Murray City Corp., representing Utah Chapter ICC, requests Approved as Submitted.

Commenter’s Reason: Original language is awkward. Proposed modification makes clear construction documents, approvals & permits are for fire protection systems.

F84-02
903.2.1.1 through 903.2.1.4 (IBC 903.2.1.1 through 903.2.1.4)

Proposed Change as Submitted:

Proponent: Billy Kennett, City of Columbia, South Carolina; representing City of Columbia, South Carolina

Revise as follows:

903.2.1.1 (Supp) Group A-1. An automatic sprinkler protection system shall be provided for Group A-1 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²)
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than the level of exit discharge.

903.2.1.2 (Supp) Group A-2. An automatic sprinkler protection system shall be provided for Group A-2 occupancies where one of the following conditions exist:

1. The fire area exceeds 5,000 square feet (464.5 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than the level of exit discharge.

903.2.1.3 (Supp) Group A-3. An automatic sprinkler protection system shall be provided for Group A-3
occupancies where one of the following conditions exist:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than the level of exit discharge.

903.2.1.4 (Supp) Group A-4. An automatic sprinkler protection system shall be provided for Group A-3 occupancies where one of the following conditions exist:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than the level of exit discharge.

Proponent’s Reason: The IBC requires that assembly spaces with an occupant load of 300 or more be sprinklered. A similar requirement is not found in The BOCA National Building Code, the Standard Building Code (SBC) or the Uniform Building Code®. In general these codes do not require sprinklers until the following conditions exist.

In general the NBC does not require an assembly occupancy to be sprinklered unless the space exceeds 12,000 square feet, or 5,000 square feet in the case of a night club. As the following table shows, the IBC will require many assembly spaces to be sprinklered even though the area will be considerably smaller than 5,000 square feet.

The SBC does not require an assembly occupancy to be sprinklered unless the building has a large occupant load (over 1000 people), the area exceeds 15,000 square feet, and it is used for the display, sale or storage of combustible materials. As the following table shows, the IBC will require many assembly spaces to be sprinklered even though the area will be considerably smaller than 15,000 square feet and are not being used for display of combustible materials.

In general the UBC does not require an assembly occupancy to be sprinklered unless the space is used for exhibition or display purposes and exceeds 12,000 square feet, or 5,000 square feet in the case of a night club, like the BNBC. As the following table shows, the IBC will require many assembly spaces to be sprinklered even though the area will be considerably smaller than 5,000 square feet or are not being used for display of combustible materials.

Committee Reason: The code change would remove fire sprinkler requirements in buildings with large groups of people.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Barry N. Gupton, North Caroline Department of Insurance, representing North Carolina Office of State Fire Marshal, requests Approved as Modified.

Modify current text as follows:

903.2.1.3 (Supp) Group A-3. An automatic sprinkler protection system shall be provided for Group A-3 occupancies where one of the following conditions exist:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.

Exceptions:

1. Areas used primarily for worship with fixed seating and part of a separated use.
2. Areas consisting of a single multipurpose room that are not used for exhibition or display and are part of a separated use.
3. The fire area is located on a floor other than the level of exit discharge.

Exception: Areas used exclusively as participant sports areas where the main floor area is located at the same level as the level of exit discharge of the main entrance and exit.

Commenter’s Reason: The fire area sprinkler requirements in Groups A-1 through A-5 appear to have been taken from NFPA 101; However, the companion exceptions were not brought forth. NFPA 101-2000, Section 12.3.5 has three exceptions that should apply to Groups A-3 and A-4.

NFPA 101-2000, Section 12.3.5, Exception 1 is for places of worship with fixed seating. This new exception applied to Section 903.2.1.3. Item 2 will allow more occupant load while limiting the fire area to 12,000-SF on the level of exit discharge. The fire load is low in such rooms, the aisles are delineated by fixed seating, and the occupants are more familiar with the building.

NFPA 101-2000, Section 12.3.5, Exception 2 is for a single multipurpose room. This new exception applied to Section 903.2.1.3. Item 2 will allow more occupant load while limiting the fire area to 12,000-SF on the level of exit discharge. The fire load is low in such rooms since exhibition and display are prohibited.

NFPA 101-2000, Section 12.3.5, Exception 3 is for participant sports rooms. This existing exception applied to Sections 903.2.1.3 (and 903.2.1.4), Item 1 will allow the fire area to exceed 12,000-SF while limiting the occupant load to 300 on the level of exit discharge. The fire load is low in such rooms.
**F85-02**

903.2.2 (IBC 903.2.2)

*Proposed Change as Submitted:*

**Proponent:** Greg Rogers, Kitsap County Fire District 7; representing Washington State Association of Fire Marshals

*Revise as follows:*

**903.2.2 Group E.** An automatic sprinkler system shall be provided throughout all fire areas containing Group E occupancies, fire areas greater than 20,000 square feet (1,858 m²) in area. An automatic sprinkler system shall be provided for every portion of educational buildings below the level of exit discharge.

**Proponent’s Reason:** Surveys through Fire Journals and the national Fire Incident Reporting system have shown the fires in educational occupancies have increased a +6.7 percent. The surveys also show that the annual dollar loss has increased over previous years by 44.8 percent, this totals 84,000,000 dollar increase over previous years. Taken this data into consideration, this type of loss to a community could be tragic. The dollar loss alone would be a financial impact on the community as well as the school district. This dollar loss does not include the cost of relocating the school or classes to a temporary facility.

**Committee Action:** Disapproved

**Committee Reason:** The code change would be too restrictive.

**Assembly Action:** No Motion

**Individual Consideration Agenda:**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Greg Rogers, Washington Association of Fire Marshals, requests Approved as Submitted.

**Commenter’s Reason:** The disapproval offered for the committee is that the code change would be to restrictive, really is weak when you consider that currently other occupancies required to have sprinkler systems in the IFC is only 12,000 square feet. Washington State’s current statistics for the first quarter of 2002 for educational occupancies indicates a dollar loss of $17,015,750. For the year of 2001 the State of Washington reported 147 school fires. These statistics do not include data from the three largest cities Seattle, Tacoma, and Spokane, nor does it include the value to rebuild the schools. I would encourage the approval of this item as submitted based on the statistics provided and show that the fire service needs to change this trend in educational occupancies.

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**F86-02**

903.2.2 (IBC 903.2.2)

*Proposed Change as Submitted:*

**Proponent:** Ken Schoonover, KMS Associates, Inc.

*Revise as follows:*

**903.2.2 Group E.** An automatic sprinkler system shall be provided throughout for Group E occupancies as follows: fire areas greater than 20,000 square feet (1858 m²) in area. An automatic sprinkler system shall be provided for every portion of educational buildings below the level of exit discharge.

1. Throughout all Group E fire areas greater than 20,000 square feet (1858 m²) in area.
2. Throughout every portion of educational buildings below the level of exit discharge.

**Exception:** An automatic sprinkler system is not required in any fire area or area below the level of exit discharge where each every classroom throughout the building has at least one exterior door at ground level.

**Proponent’s Reason:** The purpose of this proposal is to clarify the intended application of sprinkler requirements in Group E occupancies. As presently constructed, the second sentence could be read to mean that when sprinklers are required in a 20,000 sq. ft. fire area, then sprinklers are ALSO required in basements. Base on how this provision evolved from through the various drafts in the IBC original development of the IFC, it appears the tow criteria were intended to be independent thresholds. Secondly, the exception is not explicit as to whether it applies only to classrooms in 20,000 sq. ft. and larger fire areas or only where classrooms that are located above areas below the level of exit discharge. For example, in a three story classroom building with a 20,001 sq. ft. fire area on the first story where classrooms in that fire area have the required exit doors, one could misinterpret that sprinklers are not required. It is believed that the intent is (or should be) that in order to minimize the risk to children of exposure to fire in a building with a large fire area or areas below grade, regardless of where the classrooms are located, all classrooms must have an exit door at grade in order for the exception to apply; and that in such cases, the building can be unsprinklered regardless of fire area size or spaces located below the level of exit discharge. Lastly, it places the section in the item listing format (similar to the Group A requirements) which makes it easier to understand that the two conditions are separate and independent, either of which will trigger the sprinkler requirement in that space. This proposal will not increase their cost of construction.

**Committee Action:** Disapproved

**Committee Reason:** The code change reformat would be confusing to the user.

**Assembly Action:** No Motion

**Individual Consideration Agenda:**
This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

David S. Collins, The PREVIEW Group, Inc, representing The American Institute of Architects; requests Approved as Submitted.

Commenter’s Reason: The stated reason for denying the changed format is that “the code change format would be confusing to the user.” The change is clearly parallel to provisions contained in most of the remaining sections of the code that require the installation of a fire suppression system. Sections 903.2.1.1, 903.2.1.2, 903.2.1.3, 903.2.1.4, and 903.2.1.5, all use the same format as proposed in this change. This format makes the criteria that are contained within the section clear and distinct. This is an improvement to the application and understanding of the code.

Public Comment 2:

Ken Schoonover, KMS Associates, Inc., requests Approved as Modified by this Public Comment.

Modify proposal as follows:

903.2.2 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 20,000 square feet (1858 m²) in area.
2. Throughout every portion of educational buildings below the level of exit discharge.

Exception: An automatic sprinkler system is not required in any fire area or area below the level of exit discharge where each classroom throughout the building has at least one exterior exit door at ground level.

Commenter’s Reason: The overall purpose of the proposed change was to clarify the how the requirements apply. The reasons are expressed in the original supporting statement. The IFC Code Committee and the public testimony at the Pittsburgh hearings expressed general agreement with the proposed change but had some difficulty with the revision to the exception. The published committee reason indicates that the problem with the proposal is one of confusing format. I certainly hope is not that, since the proposal uses the same format as many other current sprinkler sections.

Among the concerns that I recall raised was concern over the logic of exempting sprinklers from below grade areas without classrooms based on the arrangement of exit doors from classrooms on another story. Another question was whether the exception should only address the classrooms within the fire area that would be exempt. These questions are certainly valid and confirm the need for clarification of the exception. However, this proposed change has not created that problem. That problem exists now. I am reasonably sure that any alternative wording for the exception to the original proposal will not satisfy everyone’s questions. There were too many different opinions on what would be the correct threshold. We cannot in the public comment process explore all of the different possibilities and arrive at an agreeable threshold. That will have to be done in a new proposal. As such, I would encourage the membership to defeat the motion for disapproval. The modification provides the option to approve the proposed change without any changes to the exception.

The other aspects of the proposal will still be a useful improvement for the 2003 IBC.

Procedurally, if the motion for Disapproval is defeated, you can also vote for APPROVAL AS SUBMITTED. I still submit that the original proposed revision to the exception accurately reflects the intent of the current exception. Whether the exception needs substantive revision is a matter for future change. The proposal as submitted would at least make more clear the exception as written now, considering the following.

1. The current exception is stated as a complete exception to entire requirement. The originally proposed new text at the beginning of the exception says the same thing.
2. The current exception applies “where each classroom” has the exit door indicated. This begs the question, which classrooms? The proposed change took the view that each classroom means just that, each classroom in the building. This exception was established many years ago in the BOCA National Building Code. The exception was originally based on the concept that a fire area of a size that is deemed to necessitate sprinklers represents a life safety threat to all children everywhere in the building, and that if an exception is going to be granted, it should only be granted when all classrooms provide the opportunity for quick, direct exiting to the exterior without traveling through interior spaces.

Approval of this proposal either as submitted or as modified will be a useful improvement.

F90-02
903.2.7; 903.2.8 (New) (IBC 903.2.7; 903.2.8 [New])

Proponent: Charles (Chip) Clark, National Concrete Masonry Association (NCMA); representing Masonry Alliance for Codes and Standards

1. Revise as follows:

903.2.7 (Supp) Groups R-1 and R-4. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R-1 or Group R-4 fire areas.

2. Add new text as follows:

903.2.8 Group R-2. An automatic sprinkler system shall be provided throughout buildings with a Group R-2 fire area where more than two stories in height, including basements, or where having more than 16 dwelling units.

Exception: A residential sprinkler system installed in accordance with Section 903.3.3 shall be provided in buildings, or portions thereof, of Group R-2.

Proponent’s Reason: We are proposing to reinsert the threshold requirements for automatic sprinklers for buildings containing Group R-2 occupancies which were originally contained in Section 903.2.8 of the 2000 International Fire Code® and International Building Code®. We are concerned that the ICC membership has erred in requiring that all Group R occupancies be protected throughout with
We believe the threshold limits provided in the 2000 IBC for Group R-2 buildings requiring sprinklers do address what we believe is an adequate level of life safety. Any such building that is more than 2 stories in height must be sprinklered. Any such building containing more than 16 dwelling units must be sprinklered. Thus, for all practical purposes, the largest building a Group R-2 occupancy can be without providing automatic sprinklers is one that is 2 stories in height. This does not mean that there needs to be an absolute level of life safety, but only that the level of life safety provided is acceptable in terms of the overall expectations of our society.

We believe the threshold limits provided in the 2000 IBC® for Group R-2 buildings requiring sprinklers do address what we believe is an adequate level of life safety. Any such building that is more than 2 stories in height must be sprinklered. Any such building containing more than 16 dwelling units must be sprinklered. Thus, for all practical purposes, the largest building a Group R-2 occupancy can be without providing automatic sprinklers is one that is 2 stories in height. This does not mean that there needs to be an absolute level of life safety, but only that the level of life safety provided is acceptable in terms of the overall expectations of our society.

Committee Action: Disapproved

Committee Reason: The code change was disapproved to be consistent with previous membership actions in F45-00 and F39-01 and is considered a life safety issue.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Ronald W. Clements Jr., Chesterfield County, representing VA Building and Code Officials Association, requests Approved as Submitted.

Commenter’s Reason: This proposal will reinstate the exception that appears in the 2000 IBC. Many multi-family buildings cannot be economically sprinklered, if an adequate public water supply does not exist. This code section was modified based on testimony attempting to get single-family dwellings sprinklered. Though the original committee was not aware that single-family dwellings are not regulated by the fire and building codes, the committee approved the change with no technical justification for the uses affected. The committee even went so far as to say they new the regulation would be modified by many states and was excessive but a message needed to be sent. The building codes should not be used to send messages that’s what resolutions are for.

F98-02
904.11.1 (IBC 904.11.1)

Proposed Change as Submitted:

Proponent: Michael J. Laderoute, MJL Associates, Inc.; representing fire Equipment Manufacturer’s Association, Inc.

Revise as follows:

904.11.1 Manual system operation. A manual actuation device shall be located at or near a means of egress from the cooking area, minimum of 10 feet (3048 mm) and a maximum of 20 feet (6096 mm) from the kitchen exhaust system. The manual actuation device shall be located a minimum of 4.5 feet (1372 mm) and a maximum of 5 feet (1524 mm) above the floor. The manual actuation shall require a maximum force of 40 pounds (178 N) ad a maximum movement of 14 inches (356 mm) to actuate the fire suppression system.

Exception: Automatic sprinkler systems shall not be required to be equipped with manual actuation means.

Proponent’s Reason: There are no sprinkler heads listed for use in the protection of commercial cooking operations so the Exception serves no purpose. The code should not contain unnecessary verbiage.

Staff Analysis: The only cooking appliance for which a specifically listed sprinkler head is required is deep fat fryers (NFPA 13-99 Sec. 4-9.8.2). The unavailability of such sprinklers does not affect the suitability of standard sprinklers for protecting all other appliances and the exhaust system. Therefore, deleting the exception would require manual operation would require manual operation for sprinkler systems protecting commercial cooking in accordance with NFPA 13-99, Section 4-9.8.

Committee Action: Disapproved

Committee Reason: The code change would remove protection allowed under the code and not affecting the cooking surface protection. The lack of sprinklers to protect the cooking surface does not affect the suitability of standard sprinklers to protect other appliances and the exhaust system.

Assembly Action: Approved as Submitted - Failed

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Committee’s Reason: There are no sprinkler heads listed for use in the protection of commercial cooking operations so the exception serves no purpose. The code should not contain unnecessary verbiage. The committee agreed with this proposal during the hearings in Pittsburgh, but could not approve it due to the IFC still containing references to sprinkler protection for this type of hazard. Public Comment submitted toward proposal F94-02, if accepted, will modify section 904.11 to reflect only recognized systems for commercial cooking hazards. Since there are NO carbon-dioxide, sprinklers, foam or dry chemical systems listed or approved for this hazard they need to be removed from the code. Exception 904.11.1 should also be deleted as sprinklers cannot be used for protection of this type hazard.

**F101-02**

905.2 (IBC 905.2)

Proposed Change as Submitted:

Proponent: Jackie Gibbs, Southeastern/Southwestern Association of Fire Chiefs Code Committee; representing SBCCI Code Action Committee

Revise as follows:

905.2 Installation standards. Standpipe systems shall be installed in accordance with this section and NFPA 14.

**Exception:** In other than high-rise buildings where buildings are sprinklered in accordance with 903.3.1.1, the water supply is not required to meet the higher pressures required for a standpipe system.

Proponent’s Reason: Most modern fire departments have pumps on their responding fire apparatus, coupled with the facts that:

1. properly installed sprinkler systems hold fires in check until the fire department’s arrival and
2. most standpipe systems now no longer have hose attached for occupant use, the necessary higher pressure needed on the standpipe systems for fire department use can be attained by the fire department pressurizing the system. Therefore the requirements for these standpipes to meet the higher pressure requirements of NFPA 14 are no long necessary.

Committee Action: Approved as Modified

Modify proposal as follows:

905.2 Installation standards. Standpipe systems shall be installed in accordance with this section and NFPA 14.

**Exception:** In other than high-rise buildings where buildings are sprinklered in accordance with 903.3.1.1, the water supply is not required to meet the higher pressures required for the standpipe system.

Committee Reason: The code change acknowledges that higher pressures required are not necessary for the sprinkler system and that fire departments can supplement the pressure when needed.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter’s Reason: The proposed revision is not necessary because NFPA 14 already provides what the proponent has requested. NFPA 14, Section 3-4.1 permits manual Class I standpipes in non-high rise buildings, whether sprinklered or not. Therefore, there is no requirement for ANY automatic water supply on a Class I standpipe system (or the associated water pressure) in buildings that don’t exceed the high-rise threshold.

Even where a common riser supplies sprinklers and standpipes in a mid-rise structure, NFPA 14 does not require the water supply provided for sprinklers to also satisfy the standpipe demand. NFPA 14 permits the sprinkler demand to be supplied by the automatic water supply and the standpipe demand to be supplied via the fire department connection (FDC) and a fire department pumper truck.

The code change, as proposed, actually opens the door to a substandard design by reducing the standpipe pressure requirement from any water supply, even when the water supply is provided via the FDC. Obviously, this is not what was intended by the proponent. Surely, the proponent would agree that the FDC must be designed to satisfy the standpipe demand regardless of whether the building is sprinklered or not, so that the fire department can properly support the system if sprinklers somehow fail to control the fire.

It is also worth noting that the 2003 edition of NFPA 14 will be modified to more clearly address the proponent’s concerns by clarifying the current text of the standard and providing appropriate cross-references between applicable provisions.

**F106-02**

905.10 (IBC 905.10)

Proposed Change as Submitted:

Proponent: John Terry, Chairperson, ICC IEBC Drafting Committee

905.10 During construction. Standpipe systems required during construction, alteration and demolition operations shall be provided in accordance with Section 1412. Standpipe systems required during
alteration of buildings shall comply with the International Existing Building Code.

[F] IBC 905.10 During construction. Standpipe systems required during construction, alteration and demolition operations shall be provided in accordance with Section 3311. Standpipe systems required during alteration of buildings shall comply with the International Existing Building Code.

Proponent’s Reason: The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings. The IEBC contains specific provisions for fire alarms and standpipes for alterations of existing buildings.

The International Existing Building Code (IEBC), 2003 Final Draft, was published in August 2001. The proposed code change submitted here is a part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

Committee Action: Disapproved
Committee Reason: Based on previous section as item F4-02.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Terry, State of New Jersey, representing the International Existing Building Code Drafting Committee, requests Approved as Modified.

906.1 (Supp) Where required. Portable fire extinguishers shall be installed in the following locations.


Exception: In Group A, B, and E occupancies equipped throughout with quick response sprinklers, fire extinguishers shall be required only in special hazard areas.

2. (No change to current text)

Committee Action: Disapproved
Committee Reason: The code change would allow removal of fire extinguishers in high hazard areas. The exception is a reasonable requirement.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:


Commenter’s Reason: Fire extinguishers are the first line of defense for small, controllable fires, and the national standard states they are intended to use for fires of limited size and are needed even when other fire protection methods are provided. NFPA statistics confirm fire extinguishers control more fires in their incipient stage than any other method. A balanced fire protection plan must include both fire extinguishers and sprinklers, in addition to the other established requirements.

Committee Action: Disapproved
Committee Reason: The code change would allow removal of fire extinguishers in high hazard areas. The exception is a reasonable requirement.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:


Commenter’s Reason: Fire extinguishers are the first line of defense for small, controllable fires, and the national standard states they are intended to be used for fires of limited size and are needed even when other fire protection methods are provided. NFPA statistics confirm fire extinguishers control more fires in their incipient
stage than any other method. A balanced fire protection plan MUST INCLUDE both fire extinguishers and sprinklers, in addition to the established requirements.

Public Comment 2:

Michael G. Kraft, Ohio Division of State Fire Marshal, requests Approved as Submitted.

Commenter’s Reason: The availability of portable fire extinguishers for incipient fires is a basic tenet that should not have been provided this exception. In Group A, B and E occupancies there are typically awake, alert and capable individuals to respond with a portable extinguisher. If a fire watch is instituted in these occupancies when the sprinkler system is inoperative, the availability of extinguishers throughout the facility would be helpful.

F118-02
907.2.8, 907.2.9 (IBC 907.2.8, 907.2.9)

Proposed Change as Submitted:

Proponent: Jackie Gibbs, Marietta Fire & Emergency Services Department; representing Southeastern and Southwestern Association of Fire Chiefs Code Action Committee

Revise as follows:

907.2.8 (Supp) Group R-1. A manual fire alarm system and an automatic fire detection system shall be installed in Group R-1 occupancies.

Exceptions:

1. No change
2. No change
3. A separate fire alarm system is not required in buildings that are equipped throughout with an approved supervised automatic sprinkler system and which have a local fire alarm that meets the notification requirements of Section 907.10.2: Manual fire alarm boxes are not required if the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or Section 903.3.1.2 and the notification appliances will activate upon sprinkler water flow.

907.2.9 (Supp) Group R-2. A fire alarm system shall be installed in Group R-2 occupancies where:

1. Any dwelling unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit; or
3. The building contains more than 16 dwelling units

Exceptions:

1. No Change
2. A separate fire alarm system is not required in buildings that are equipped throughout with an approved supervised automatic sprinkler system installed in accordance with Section 903.3.1.1 or Section 903.3.1.2 and which have a local alarm that meets the notification requirements of 907.10.2: Manual fire alarm boxes are not required if the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or Section 903.3.1.2 and the notification appliances will activate upon sprinkler water flow.

Proponent’s Reason: Clarifies the original intent of the sections. It was the original intent that sprinklers would only eliminate the manual pull stations and would not eliminate the requirements for audio and visual notification devices.

Committee Action: Approved as Modified

Modify as follows:

907.2.8 Group R-1. Fire alarm systems shall be installed in Group R-1 occupancies as required in Section 907.2.8.1 through 907.2.8.3.

907.2.8.1 Manual fire alarm system. A manual fire alarm system and an automatic fire detection system shall be installed in Group R-1 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not over two stories in height where all individual guestrooms and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each individual guestroom has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
   1. The building is equipped throughout with an automatic sprinkler system.
   2. The notification appliances will activate upon sprinkler flow, and
   3. At least one manual fire alarm box is installed at an approved location.

907.2.8.2 Automatic fire alarm system. An automatic fire alarm system shall be installed throughout all interior corridors serving guestrooms.

Exception: An automatic fire detection system is not required in buildings that do not have interior corridors serving guestrooms and each guestroom has a means of
egress door opening directly to an exterior exit access that leads directly to an exit.

907.2.8.3 Fire detection system Smoke alarms. System Smoke detection alarms are not required in guestrooms provided that the single-station smoke alarms shall be installed as required by Section 907.2.10. In buildings that are not equipped throughout with an automatic sprinkler system, the smoke alarms in guestrooms shall be connected to the an emergency electrical system and shall be annunciated by guestroom at a constantly attended location from which the fire alarm system is capable of being manually activated.

907.2.9 Group R-2. A fire alarm system shall be installed in Group R-2 occupancies where:

1. Any dwelling unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit; or
3. The building contains more than 16 dwelling units

Exceptions:
1. A fire alarm system is not required in buildings not over two stories in height where all dwelling units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
   1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2,
   2. The notification appliances will activate upon sprinkler flow, and
   3. At least one manual fire alarm box is installed at an approved location.

Committee Reason: The code change provides clarification between manual and automatic system requirements for Group R-1 and R-2 occupancies.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, International Code Consultants, representing National Multi Housing Council, requests Approved as Modified by this Public Comment.

1. Modify Section 907.2.8.1, Exception 2 of the proposal as follows:
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:

   1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
   2. The notification appliances will activate upon sprinkler waterflow, and
   3. At least one manual fire alarm box is installed at an approved location.

2. Modify Section 907.2.8.3 of the proposal as follows:

   907.2.8.3 (Supp) Smoke alarms. Smoke alarms shall be installed as required by Section 907.2.10. In buildings that are not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the smoke alarms in guestrooms shall be connected to an emergency electrical system and shall be annunciated by guestroom at a constantly attended location from which the fire alarm system is capable of being manually activated.

Commenter’s Reason: Clarifies that both NFPA 13 and NFPA 13R sprinkler systems are appropriate for R-1 uses with respect to these provisions, and provides consistency between the requirements for R-1 and R-2 uses in this code change. Similar sections in the R-2 use section included in the proposal specifically mention Sections 903.3.1.1 and 903.3.1.2.

F121-02

907.2.9, 907.2.10.3, 907.2.12.2, 907.3.1.7, 907.10.1.3 (IBC 907.2.9, 907.2.10.3, 907.2.12.2, 907.9.1.3)

Proposed Change as Submitted:

Proponent: Steven Rocklin, Jody Nolan, State of New York, Department of State, Division of Code Enforcement, Tom DeMint, Poudre Fire Authority; representing State of New York, Department of State, Division of Code Enforcement

Revise as follows:

907.2.9 (Supp) Group R-2. A fire alarm system shall be installed in Group R-2 occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions:
1. A fire alarm system is not required in buildings not over two stories in height where all dwelling units or sleeping units and contiguous attic and crawl
spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.

2. (No change to current text)

907.2.10.3 (Supp) Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R-2, R-3 or R-4, or within an sleeping unit in Group R-1, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

907.2.12.2 (Supp) Emergency voice/alarm communication system (High Rise Buildings). The operation of any automatic fire detector, sprinkler water-flow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving approved information and directions on a general or selective basis to the following terminal areas in accordance with the building’s fire safety and evacuation plans required by Section 404.

1-3 (No change to current text)

4. Dwelling units and sleeping units in Group R-2 occupancies.

5 and 6 (No change to current text)

907.3.1.7 Group R-2. A fire alarm system shall be installed in existing Group R-1 apartment buildings occupancies with more than three stories in height or with more than 16 dwelling units or sleeping units.

907.10.1.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with ICC A117.1

[IBC]907.9.1.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with ICC A117.1

Proponent’s Reason: The propose of the proposed amendments is to assure that the protection and means of egress specified for dwelling units in Group R-2 occupancy also are applicable to sleeping units in this occupancy group. Since R-2 occupancy includes boarding houses, convents and monasteries, dormitories and similar occupancies that contain sleeping units, but not dwelling units, it is necessary to add provisions or exceptions for such uses to the IFC® and IBC®.

If the provisions of the IFC and IBC are permitted to remain, there would be no requirement in Section 907.2.9 for a fire alarm system in dormitories, regardless of the area or height of the building, or the number of occupants. This cannot be the intention of the IFC, as it would provide no protection to residents in single-room occupancies. Rather, the failure to include sleeping units appears to be an oversight, as dormitories and similar housing were traditionally classified as transient occupancy multiple dwellings.

Committee Action: Approved as Submitted

Committee Reason: The code change addresses areas not covered and provides for safer occupancies. This change also aligns the IBC & IFC with the term sleeping unit.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, International Code Consultants, representing National Multi Housing Council, requests Approved as Modified by this Public Comment.

SECTION 902 DEFINITIONS

Add a definition of “Sleeping Unit” as follows:

[B] SLEEPING UNIT. A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

Commenter’s Reason: Item F121-02 adds requirements for fire alarms associated with sleeping units based on the addition of provisions for sleeping units in the 2002 IBC Accumulative Supplement; however, the definition from the IBC was not carried over as part of the proposal. This lack of a definition in the fire code could lead to difficulty in interpreting the code and non-uniform enforcement. The proposed definition is exactly duplicated from the IBC definition added in the 2002 Accumulative Supplement (Page IBC-3).

F123-02

907.2.10.1.1 (IBC 907.2.10.1.1), 907.2.10.1.2 (IBC 907.2.10.1.2), IRC R317.1

Proposed Change as Submitted:
Proponent: Rick Davidson, City of Hopkins; Robert D. Lee, Town of Cave Creek; representing Arizona Building Officials (AZBO)

THIS PROPOSAL IS ON THE AGENDA OF THE IFC AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Part 1:

Revise as follows:

907.2.10.1.1 (Supp) Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the sleeping unit.
3. Where the ceiling height of a room open to the hallway servicing bedrooms exceeds that of the hallway by 24 inches or more, smoke detectors shall be installed in the hallways and in the adjacent room.

3-4. In each story within the sleeping unit, including basements. For sleeping units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.10.1.2 Groups R-2, R-3, R-4 and I-1. Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of occupant load at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.
3. Where the ceiling height of a room open to the hallway serving the bedrooms exceeds that of the hallway by 24 inches (610 mm) or more, smoke alarms shall be installed in the hallway and in the adjacent room.

3-4. In each story within a dwelling unit, including basements and cellars but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

Part 2:

Revise the IRC as follows:

IRC R317.1 Single- and multiple-station smoke alarms. Single- or multiple-station smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside of each separate sleeping area in the immediate vicinity of the bedrooms.
3. Where the ceiling height of a room open to the hallway serving the bedrooms exceeds that of the hallway by 24 inches (610 mm) or more, smoke alarms shall be installed in the hallway and in the adjacent room.
3-4. On each additional story of the dwelling including basements and cellars but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

(Balance to remain unchanged)

Proponent’s Reason: This proposal provides added safety and protection for occupants of homes with high vaulted ceilings, which trap smoke and prevent it from reaching alarms thereby delaying notification of the occupants and their ability to exit the building.

Staff Note: The text between the IFC/IBC and the IRC are somewhat different and in different order. However, the overall intent is the same.

ITEM 1 (IFC)
Committee Action: Disapproved
Committee Reason: The code change needs to reflect additional work being done in this area to address the issue.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Approved as Submitted
Committee Reason: This proposal provides added safety and protection for occupants of homes with high vaulted ceilings, which trap smoke and prevent it from reaching alarms thereby delaying notification of the occupants and their ability to exit the building.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because public comments were submitted and the public hearing actions resulted
in a technical inconsistency between the IFC and the IRC.

Public Comment 1:


Commenter’s Reason: The installation of a smoke detector in the high ceiling room is not necessary. Smoke detectors are required in the sleeping rooms, outside each sleeping area, and on each additional floor. In most situations, the proposal will require only one additional smoke detector. This additional smoke detector will be in the room with the high ceiling. This room will probably have either a fireplace or be located next to a cooking area. These two conditions can cause smoke from other than an unwanted source that will probably be the reason for disconnecting the smoke detector in this high ceiling room. The fireplace and cooking facilities will be a source of false alarms. The occupants will either become insensitive to the smoke detector alarm or disconnect the smoke detector. In disconnecting the smoke detector, the occupants may disable the entire smoke detector system. In either scenario, the effectiveness of the smoke detector has been reduced.

Public Comment 2:

Matthew D. Dobson, National Association of Home Builders, requests Disapproved for Item 2.

Commenter’s Reason: The Fire Code Committee has disapproved this proposal because there is currently an extensive research project being conducted by NIST’s Fire Research Division entitled “Home Smoke Alarm Tests”. With the support of several major organizations this research specifically includes the task that will “Evaluate the efficacy of current requirements for number and location of smoke alarms”.

This proposal jumps the gun on implementing new smoke detector locations and requirements. Once the research is complete we may have a clearer understanding of how to increase the effectiveness of smoke detectors, including the number of detectors and locations. Any amendment of current requirements until that research is complete is premature. Furthermore the proposal offered no technical data to substantiate potential inadequacies or how this change will provide additional fire safety. Wait until the research is complete.

Analysis: The following combinations of actions would achieve technical consistency between the IFC and the IRC:

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F140-02

1010.1, 1010.10

Proposed Change as Submitted:

Proponent: John Terry, Chairperson, ICC International Existing Building Code Drafting Committee

Revise as follows:

1010.1 General. Means of egress in existing buildings, renovations, alterations and additions shall comply with 1003 through 1009, except as amended in 1010. Renovations, alterations, and additions of the means of egress shall be in accordance with this code and the International Existing Building Code.

Proponent’s Reason: This code change is submitted to provide correlation between the International Existing Building Code and the International Fire Code. They provide the necessary reference to the IEBC to allow the user to work in and refer to the appropriate codes when inspecting and dealing with existing buildings.

Committee Action: Disapproved

Committee Reason: Based on previous action on Item F4-02.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Terry, State of New Jersey, representing the International Existing Building Code Drafting Committee, requests Approve as Modified by this Public Comment.

Modify proposal as follows:

1010.1 General. Means of egress in existing buildings shall comply with Sections 1003 through 1009, except as amended in Section 1010. Renovations, alterations and additions of the means of egress shall be in accordance with this code and the International Existing Building Code.

Committer’s Reason: This code change was originally Disapproved. The administrative provisions in Chapter 1 of the IFC will indicate that alterations and additions are to be addressed by the IEBC. Renovations and alterations are consistent with Level 1, 2 and 3 alterations in the IEBC. Sections 505, 605 and 705 of the IEBC address means of egress for Level 1, 2 and 3 alterations, respectively. Section 901 of the IEBC requires additions to comply with the respective requirements of the building code. Therefore, keeping these requirement in the IFC creates an unnecessary conflict with the IEBC.

The IEBC Drafting Committee respectfully requests the membership approval of this public comment (AM)
from obstructions or impediments to full instant use in the case of fire or other emergency when occupied.

**Proponent's Reason:** Secondary devices are being placed on exit doors throughout the nation. Elected officials are now recognizing that owners of unoccupied buildings have a right to protect their premises and are allowing these devices by legislative changes.

**Committee Action:** Approved as Modified

Modify proposal as follows:

1011.2 Reliability. Required exit accesses, exits or exit discharges shall be maintained free from obstructions or impediments to full instant use in the case of fire or other emergency when areas served by the exits are occupied.

**Committee Reason:** This code change addresses a situation that needs to be placed in the code because legislatures are changing code to address it.

**Assembly Action:** No Motion

**Individual Consideration Agenda:**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Michael Dell’Orfano, Fire Marshal’s Association of Colorado, requests Disapproved.

**Commenter’s Reason:** The main problem with proposal F142-02 is that, once a door has been rendered inoperable by installing extra security devices, there has to be a person that will ensure that those devices have been removed prior to the building or area being occupied. This type of human intervention has traditionally only been allowed on a special classification of doors referred to as the “main exit.” The main exit is allowed to be locked during non-occupied hours because the owner/manager has a compelling interest to make sure the door is unlocked when business needs to be conducted. However, in the case of all the other doors in the building, there isn’t a compelling reason to make sure those doors are also unlocked since these doors may not be used during the normal course of a business day. If these doors have extra security locks and the owner/manager forgets to remove them, no one will know the difference until there is an emergency and occupants are unable to open the door.

Too many times we have seen doors that are chained or barred while the building is occupied and too many times we have seen people die trying to get out of crowded, smoke-filled buildings with inoperable exits. Proposal F142-02 focuses on changing the code to allow for security devices that can render the door inoperable and potentially endanger occupants and firefighting personnel during emergencies. Instead of changing the code, we need to be encouraging the door and door hardware manufacturers to develop new methods of securing doors in a manner that still satisfies the essential code requirement that all doors be operable in one motion without the use of a key or special knowledge or effort.

**F145-02**

1201.1, 1204.1, 1205.1, 1205.1.5, 1205.2, 1206.1, 1207.1, 1207.3

**Proposed Change as Submitted:**

**Proponent:** Ralph Johns/Greg Rogers, Washington State Association of Fire Marshals; representing Washington State Association of Fire Marshals

**Revise as follows:**

1201.1 **Scope.** Dry cleaning plants and their operations shall comply with the requirements of this chapter and NFPA 32.

1204.1 **Prohibited use.** Type I dry cleaning plants shall be prohibited. Limited quantities of Class I solvents stored and used in accordance with this section and NFPA 32 shall not be prohibited in dry cleaning plants.

**SECTION 1205 OPERATING REQUIREMENTS**

1205.1 **General.** The operation of dry cleaning systems shall comply with the requirements of this section and NFPA 32.

1205.1.2 - 1205.1.4 (No change)

1205.1.5 **Equipment maintenance and housekeeping.** Proper maintenance and operating practices shall be observed in order to prevent the leakage of solvent or the accumulation of lint. The handling of waste material generated by dry cleaning operations and the maintenance of facilities shall comply with the provisions of this section and NFPA 32.

1205.2 **Type II systems.** Special operating equipments for Type II dry cleaning systems shall comply with the provisions of this section and NFPA 32.

**SECTION 1206 SPOTTING AND PRETREATING**

1206.1 **General.** Spotting and pretreating operations and equipment shall comply with the provisions of this section and NFPA 32.

1207.1 **General equipment requirements.** Dry cleaning systems, including dry cleaning units, washing machines, stills, dry cabinets, tumblers, and their appurtenances, including pumps, piping, valves, filters, and solvent coolers, shall be installed and maintained in accordance with NFPA 32. The construction of buildings in which such systems are
located shall comply with the requirements of this section and the *International Building Code*. B,C portable fire extinguishers shall be provided near the doors inside dry cleaning rooms containing Type II, Type III-A and type III-B dry cleaning systems.

1207.3 Solvent storage tanks. Solvent storage tanks for Class II, IIIA and IIIB liquids shall conform to the requirements of Chapter 34 and be located underground or outside, above ground.

**Exception:** As provided in NFPA 32 for indoor inside-storage or treatment tank.

**Proponent’s Reason:** The multiple references to NFPA 32 will only cause confusion and a belief that there are other requirements in that standard not found in the IFC. In fact Chapter 12 of the IFC includes the requirements spelled out in NFPA 32 that would be applicable [note that requirements in NFPA 32 for compliance with another NFPA standard are not requirements, i.e. compliance with NFPA 30 & 90A]. Thus deleting these references cleans up the code.

Also the two remaining references to NFPA 32 are appropriate. This is for General equipment requirements and inside storage or treatment tanks. In order to improve interpretation and application the wording in the exception to section 1207.3 and the title of section 1207.1 were changed to match wording found in NFPA 32. This will assist the code official in applying the appropriate requirements.

**Committee Action:** Disapproved

**Committee Reason:** The code change would cause the code enforcer to lose requirements. The technical requirements found in the standard are needed to regulate dry cleaning establishments.

**Assembly Action:** No Motion

**Individual Consideration Agenda:**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

**Phil Ferrell, Washington State Association of Fire Marshal’s, request Approved as Submitted.**

**Commenter’s Reason:** The statement given by the committee for disapproval was that the code change would remove important referenced standards without replacement of their provisions. The current language in code only covers all the necessary provisions. NFPA uses terms not found in the IFC. The multiple references to NFPA 32 will only cause confusion and a belief that there are other requirements in that standard not found in the IFC. Other information is duplicated and yet some is simply different. Thus deleting these references cleans up the code. The two areas were references to NFPA 32 are needed still remain and have not been changed by this code change. Therefore, I would ask that you over turn the committees action and approve this item as submitted.

**1501.1 Proposed Change as Submitted:**

**Proponent:** Ralph Johns/Greg Rogers, Washington State Association of Fire Marshals; representing Washington Association of Fire Marshals

**Revise as follows:**

**SECTION 1501 GENERAL**

1501.1 Scope. This chapter shall apply to locations or areas where any of the following activities are conducted:

1. The application of flammable or combustible paint, varnish, lacquer, stain, fiberglass resins or other flammable or combustible liquid applied by means of spray apparatus in continuous or intermittent processes.

2. Dip-tank operations in which articles or materials are passed through contents of tanks, vats or containers of flammable or combustible liquids, including coating, finishing, treatment and similar processes.

3. The application of combustible powders when applied by powder spray guns, electrostatic powder spray guns, fluidized beds or electrostatic fluidized beds.

4. Floor surfacing or finishing operations in areas exceeding 350 square feet (32.5 m²).

5. The application of dual-component coating or Class I or II liquids when applied by brush or roller in quantities exceeding 1 gallon (4 L).

Spraying and dipping operations shall comply with this chapter, and NFPA 33. Dipping operations shall comply with this chapter and NFPA 34.

**Proponent’s Reason:** All of NFPA 33 and 34 should not be included in conjunction with the requirements spelled out in this chapter. To state this will confuse and cause large variations of interpretations and application. NFPA uses terms not found in the IFC such as an unenclosed spay area and limited finishing workstation. Other information is duplicated and yet some is simply different. The two areas of needed reference to NFPA 33 and 34 should be retained. These are found in sections 1504.1.2 Spray Booths. There are some generalized construction concepts in NFPA 33, Chapter 3 that could be useful. Also NFPA 34, chapter 3 is a useful reference from IFC section 1505.3 Construction of dip tanks. Again, to require the code official to apply all of chapter 15 of the IFC and all of NFPA 33 and 34 will cause a plethora of interpretations and applications.

**Committee Action:** Disapproved

**Committee Reason:** The code change would remove access to technical data, and does not replace it with information with code.
Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Greg Rogers, Washington State Association of Fire Marshals, requests Approved as Submitted.

Commenter’s Reason: The statement given by the committee for disapproval was that the code change would remove important referenced standards without replacement of their provisions. The current language in code only covers all the necessary provisions. NFPA uses terms not found in the IFC. This language would only delete the provisions that would cause for miss application or interpretation of the code. The two areas were references to NFPA 33 and 34 are needed still remain and have not been changed by this code change. Therefore, I would ask that you over turn the committees action and approve this item as submitted.

All of NFPA 33 and 34 should not be included in conjunction with the requirements spelled out in this chapter. To state this will confuse and cause large variations of interpretations and application. NFPA uses terms not found in the IFC such as an unenclosed spray area and limited finishing workstation. Other information is duplicated and yet some is simply different.

F159-02
1904.2

Proposed Change as Submitted:


Revise as follows:

1904.2 Portable fire extinguishers and hose. Portable fire extinguishers or standpipes and hose supplied from an approved water system shall be provided within 50 feet (15 240 mm) of travel distance to any machine producing shavings or sawdust. Extinguishers shall be provided in accordance with Section 906 for extra-high hazard, and standpipe and hose systems in accordance with Section 905.

Proponent’s Reason: To provide the proper reference for standpipe and hose systems.

Committee Action: Disapproved

Committee Reason: The code change language is problematic, hose systems may come off of sprinkler systems and need a reference to section 903.

F166-02
2202.1

Proposed Change as Submitted:

Proponent: C. Dennis McCann, Jr., Ohio Division of State Fire Marshal

Revise as follows:

2202.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AUTOMOTIVE SERVICE STATION. That portion of property where flammable or combustible liquids or gases used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles or approved containers.

SELF-SERVICE STATION. That portion of a service station where liquid motor fuels are dispensed from fixed approved dispensing equipment into the fuel tanks of motor vehicles or approved containers by persons other than a service station attendant.

Proponent’s Reason: Pursuant to various enforcement proceedings it was found that the definition is incomplete unless the proposed wording is added. The proposal is consistent with the NFPA standard and industry definition.

Committee Action: Approved as Submitted

Committee Reason: The code change provides appropriate
language to assist the code user.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kevin H. Scott, Kern County Fire Department, request Disapproved.

Commenter’s Reason: This proposal has added “dispensing into approved containers” into the definition of a service station. The definition is intended to apply to the facility or business. With the change that was approved the definition would now require an industrial location that fills 55 gallon drums with racing fuel for distribution to be considered a service station rather than an H occupancy. I do not believe that this was the intent of the proponent.

The simple fact that filling portable containers at a service station occurs and is an accepted practice is already acknowledged and allowed in IFC Section 2204.4.1. There is no need to state this code requirement in the definition, especially when it confuses the application of the definition.

Disapproval of this item will return the section to its current form and the definition will be appropriate for service stations, but will not unintentionally include other facilities that should not be classified as a service station.

F168-02

2205.6

Proposed Change as Submitted:


Add new text as follows:

2205.6 Warning signs. Warning signs shall be conspicuously posted within sight of each dispenser in the fuel-dispensing area and warn against the following:

1. It is illegal and dangerous to fill unapproved containers with fuel.
2. Smoking is prohibited.
3. The engine shall be shut off during the refueling process.
4. Portable containers shall not be filled while located inside the trunk, passenger compartment, or truck bed of a vehicle.

Proponent’s Reason: The general population may not be aware of this code requirement nor the associated dangers of such act. It is important to educate the public of the requirement and to prevent life and property loss from fire. Refer to Section 2204.4.3 for the code requirement.

Committee Action: Approved as Submitted

Committee Reason: The code change is a needed addition to the code.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Paul Hayward, City of Farmington, Utah, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

2205.6 Warning signs. Warning signs shall be conspicuously posted within sight of each dispenser in the fuel-dispensing area and warn against which state the following:

1. It is illegal and dangerous to fill unapproved containers with fuel.
2. Smoking is prohibited.
3. The engine shall be shut off during the refueling process.
4. Portable containers shall not be filled while located inside the trunk, passenger compartment, or truck bed of a vehicle.

Commenter’s Reason: As approved, the charging language and item #4 are a double negative. A careful reading warns someone against taking a safe action by not doing a dangerous action. Why should we be warned against a safe action?

F176-02

2209

Proposed Change as Submitted:

Proponent: Guy Tomberlin, County of Fairfax; representing ICC Ad Hoc Committee for Hydrogen Gas

Add new text as follows and re-number remaining section numbers:

SECTION 2209
HYDROGEN MOTOR-VEHICLE FUEL DISPENSING AND GENERATION STATIONS

2209.1 General. Hydrogen motor-vehicle fuel dispensing and generation stations shall be in accordance with this section and Chapter 30. Where a fuel dispensing station also includes a repair garage, the repair operation shall comply with the requirements of this chapter for repair garages.

2209.1.1 Protection from vehicles. Guard posts or other approved means shall be provided to
protect hydrogen storage systems; and use areas subject to vehicular damage in accordance with Section 312.

2209.2 Approvals. Equipment used for the storage, generation, compression or dispensing of hydrogen shall be designed for the specific application in accordance with Section 2209.2.1 and Section 2209.2.2.

2209.2.1 Approved equipment. Storage vessels, containers, pressure vessels, cylinders, pressure relief devices, including pressure valves, hydrogen vaporizers, pressure regulators and piping used for gaseous hydrogen systems shall be designed and constructed in accordance with Section 2703, NFPA 50A and NFPA 50B.

2209.2.2 Listed equipment. Hoses, hose connections, compressors, hydrogen generators, dispensers, detection systems and electrical equipment used for hydrogen shall be listed for use with hydrogen. Vehicle-fueling connections shall be listed and labeled for use with hydrogen.

2209.3 Location of dispensing operations and equipment. Generation, compression, storage and dispensing equipment shall be located outdoors, above ground.

Exceptions:
1. Generation, compression, storage or dispensing equipment in buildings of noncombustible construction, as set forth in the International Building Code, which are unenclosed for three quarters or more of the building perimeter.

2. Indoor hydrogen generation, compression, storage and dispensing equipment designed and constructed in accordance with Chapter 30. Such indoor locations shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in accordance with Section 2210.7.

3. Gaseous hydrogen storage equipment installed in vaults as constructed in accordance with the applicable requirements of Chapter 34 and meeting all of the requirements of Section 2209.3.1. Where fully or partially enclosed, such locations shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in accordance with Section 2210.7.


2209.3.1 Location on property. In addition to the requirements of Section 2203.1, generators, compression, storage and dispensing equipment shall be located in accordance with Sections 2209.3.1.1 through Section 2209.3.1.5.

2209.3.1.1 Outdoor exposures. Outdoor exposures shall require spacing to other fuels, buildings, public areas, or equivalent risks to life safety in accordance with Table 2209.3.1.1.

Exceptions:
1. Hydrogen storage, compression, generation equipment located in fully enclosed, underground vaults located no less than ten feet (10 ft.) from a lot line and constructed in accordance with Exception 3 to Section 2209.3.
2. Closed systems of 3,000 scf hydrogen or less.
### TABLE 2209.3.1.1
EQUIPMENT OR FEATURE MINIMUM SEPARATION FOR GASEOUS HYDROGEN DISPENSERS, COMPRESSORS, GENERATORS AND STORAGE VESSELS

<table>
<thead>
<tr>
<th>SITE FEATURE</th>
<th>DISTANCE (feet)</th>
<th>REASON (Origin or Derivation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building—Noncombustible walls, sprinklered or nonsprinklered</td>
<td>10</td>
<td>NFPA 50A—10 ft.</td>
</tr>
<tr>
<td>Building—Combustible walls, sprinklered or nonsprinklered</td>
<td>25&lt;sup&gt;*&lt;/sup&gt;</td>
<td>NFPA 50A—10 ft. (for greater than 15,000 scfm storage)</td>
</tr>
<tr>
<td>Building—Noncombustible walls, 2-hour fire barrier interrupts line-of-sight</td>
<td>5</td>
<td>—</td>
</tr>
<tr>
<td>Offsite sidewalks and on-site/off-site parked vehicles</td>
<td>15&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>NFPA 50A—10 ft. (reasonable interpretation)</td>
</tr>
<tr>
<td>Lot line</td>
<td>10</td>
<td>NFPA 50A—5 ft., NFPA 52—10 ft.</td>
</tr>
<tr>
<td>Air intake openings</td>
<td>25&lt;sup&gt;c&lt;/sup&gt;</td>
<td>NFPA 50A—50 ft.</td>
</tr>
<tr>
<td>Wall openings located less than 25 ft. vertically above</td>
<td>20</td>
<td>NFPA 50 A—10 ft.</td>
</tr>
<tr>
<td>Wall openings located greater than 25 ft. vertically above</td>
<td>25</td>
<td>NFPA 50A—25 ft.</td>
</tr>
<tr>
<td>Outdoor public assembly</td>
<td>25&lt;sup&gt;a&lt;/sup&gt;</td>
<td>NFPA 50A—50 ft.</td>
</tr>
<tr>
<td>Ignition source&lt;sup&gt;d&lt;/sup&gt;</td>
<td>10</td>
<td>NFPA 50A—10 ft. Other than “hot work,” no other ignition source requirement. People and vehicles are primary ignition sources (i.e., static discharge).</td>
</tr>
<tr>
<td>Flammable or combustible liquid storage—Above ground, diked in accordance with Section 3404.2.9.6.</td>
<td>20</td>
<td>Diking is advantageous.</td>
</tr>
<tr>
<td>Flammable or combustible liquid storage—Above ground, not diked</td>
<td>50</td>
<td>NFPA 50A—50 ft.</td>
</tr>
<tr>
<td>Flammable or combustible liquid storage—Below ground, vent or fill opening</td>
<td>20</td>
<td>NFPA 50A—25 ft.</td>
</tr>
<tr>
<td>Flammable gas storage (non-hydrogen)—Above ground, with common shutoff</td>
<td>25</td>
<td>—</td>
</tr>
<tr>
<td>Flammable gas storage (non-hydrogen)—Above ground, no common shutoff</td>
<td>50</td>
<td>A common shutoff system is advantageous.</td>
</tr>
<tr>
<td>Combustible waste material (see Section 304.1.1)</td>
<td>50</td>
<td>These materials should not be present presuming the code’s General Precautions Against Fire are adhered to.</td>
</tr>
<tr>
<td>Liquefied hydrogen storage—Distance to buildings, openings, lot lines, public ways and on-site/off-site parked vehicles</td>
<td>25&lt;sup&gt;d&lt;/sup&gt;</td>
<td>NFPA 52 criteria</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

- a. A reduction to 5 ft. shall be permitted where a 2-hour fire barrier interrupts the line of sight between the equipment and the exposure. The height of the barrier for vertical tanks shall be no less than one-third of the height of the tank measured vertically, and the length of the wall shall be 1.5 times the maximum diameter of the tank. The height of the barrier for vertical tanks shall be no less than one-third of the height of the tank measured vertically, and the length of the wall shall be 1.5 times the maximum diameter of the tank.
- b. A reduction to 0 ft. shall be permitted for dispensing equipment and vehicles being refueled.
- c. Measured along the natural and unobstructed line of travel (e.g., around protective walls, around corners of buildings)
- d. Ignition source. A flame, spark or hot surface capable of igniting flammable vapors or fumes. Such sources include appliance burner ignitors and hot work such as welding and open flames.
- e. For storage volume greater than or equal to 15,000 scf.

#### 2209.3.1.2 Electrical classification.
Such installations shall also follow provisions of the National Electrical Code NFPA 70 and applicable provisions of NFPA 497A.

#### 2209.3.1.3 Overhead lines.
The proximity to overhead lines shall be as follows:

- a. Not less than fifty feet (15.2 m) from the vertical plane below the nearest overhead wire of an electric trolley, train or bus line; and
- b. Not less than five feet (1524 mm) from the vertical plane below the nearest overhead electrical wire.

#### 2209.3.1.4 Canopies.
Dispensing equipment need not be separated from canopies that are constructed in accordance with the International Building Code, in a manner that would prevent the accumulation of hydrogen gas.

#### 2209.3.1.5 Rooftop locations.
Gaseous hydrogen generation and storage equipment located on the roofs of buildings shall be supported on masonry, concrete, steel or other approved noncombustible construction; provided that, where such supports are located in the building, the supports shall be afforded a fire resistance rating of 2 hours, but not less than that required by the building type of construction.
The roof assembly directly under such equipment shall also be afforded a fire resistance rating of 2 hours, but not less than that required by the building type of construction. Roof top air intakes shall be at least 15 feet from hydrogen storage equipment, be located no higher than the equipment, and shall face away from the equipment. Approved signage having 1-inch (25 mm) block letters shall be affixed at a conspicuous location on the building exterior stating: ROOF TOP HYDROGEN GENERATION AND/OR STORAGE.

2209.4 Private fueling of motor vehicles. Self-service hydrogen-dispensing systems, including key code and card-locked dispensing systems, shall be limited to the filling of permanently mounted fuel containers on hydrogen-powered vehicles.

In addition to the requirements in Section 2210, the owner of a self-service hydrogen-dispensing facility shall provide for the safe operation of the system through the institution of a fire safety plan submitted in accordance with Section 404, the training of employees and operators who use and maintain the system in accordance with Section 406, and provisions for hazard communication in accordance with Section 407.

2209.5 Valves. Piping to equipment shall be provided with a readily accessible manual shut-off valve that is readily identifiable.

2209.6 Emergency shutdown. Emergency shutdown devices shall be located within 75 feet (22860 mm) of, but not less than 25 feet (7620 mm) from, dispensers and hydrogen generators, and shall also be provided in the compressor area. Upon activation, emergency shutdown shall automatically shut off the power supply to all hydrogen storage, compression, dispensing and generating equipment, shut off natural gas or other fuel supply to the hydrogen generator, and close valves between the main supply and the compressor and between the storage containers and dispensing equipment.

2209.7 Emergency venting of hydrogen systems. Hydrogen systems shall be equipped with venting that will relieve excessive internal pressure. Hydrogen systems shall not discharge inside buildings. All portions of the system shall be protected by pressure relieving devices.

2209.7.1 Vent pipe. A vent pipe that will divert the gas flow to atmosphere shall be installed on the vessel for purging operations. The vent pipe shall be designed and constructed as follows:

1. The piping shall be constructed of pipe or tubing materials approved for hydrogen service in accordance with ASME B31.3 for the rated pressure, volume and temperature. The vent piping shall be designed for the maximum back pressure within the pipe, but not less than 335 psig.

2. The vent pipe shall be properly supported and shall be provided with a rain cap or other feature which would not limit or obstruct the gas flow from venting vertically upward.

3. A means shall be provided to prevent water, ice and other debris from accumulating inside the vent pipe or obstructing the vent pipe.

4. Venting of hydrogen gases shall be as follows:

4.1 The height (H) and separation distance (D) of the vent pipe shall meet the criteria set forth in Table 2209.7.1 for the combinations of maximum hydrogen flow rates and vent stack opening diameters listed; or

4.2 The maximum emergency purging flow rate shall be specified for verification by the authority having jurisdiction. The maximum emergency purging flow rate shall be the pressure relief device release rate in accordance with CGA S-1.3 for a non-engulfing flame or the maximum on-site production rate, whichever is larger.

4.3 Where alternative venting arrangements are proposed, an analysis of radiant heat exposures shall be provided showing (in a 30 ft./sec wind): exposures to employees are limited to no more than 1,500 Btuh/ft² for a maximum of three minutes, exposures to noncombustible equipment are limited to no more than 8,000 Btuh/ft², exposures simulated at the property line are limited to no more than 500 Btuh/ft² and that no equipment or personnel within D or H, or any property line within 1.25 D would be exposure to more than one-half of the lower flammable limit (LFL) for hydrogen (2 percent by volume).

5. At the connection fitting of the vent pipe and the hydrogen cylinder, a listed bi-directional detonation flame arrester shall be provided.
TABLE 2209.7.1 HYDROGEN VENT STACK HEIGHT (H) VERSUS DISTANCE (D) REQUIREMENTS

**H** = Minimum height of vent stack above the ground or above any structure/equipment within distance D where personnel may be present (ft.).

**D** = Distance to adjacent structure/equipment where personnel may be present (ft.).

### HEIGHT AND SEPARATION DISTANCE VERSUS HYDROGEN FLOW RATE AND VENT PIPE DIAMETER

<table>
<thead>
<tr>
<th>Vent Dia (in.)</th>
<th>Vent Dia (in.)</th>
<th>Vent Dia (in.)</th>
<th>Vent Dia (in.)</th>
<th>Vent Dia (in.)</th>
<th>Vent Dia (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-500 SCFM</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>500-1000 SCFM</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>1,000-2,000 SCFM</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2,000-5,000 SCFM</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5,000-10,000 SCFM</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10,000-20,000 SCFM</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**H** (ft.)
- 8
- 8
- 8
- 8
- 12
- 12
- 12
- 12
- 22
- 22
- 22
- 22
- 36
- 36

**D** (ft.)
- 13
- 13
- 15
- 17
- 22
- 26
- 39
- 36
- 40
- 53
- 53
- 53
- 81
- 81

For SI:
1 foot = 304.8 mm.

- a. Minimum distance to property line is 1.25D.
- b. Designs seeking to achieve greater heights with commensurate reductions in separation distances shall be designed in accordance with accepted engineering practice.
- c. With this table personnel on the ground or on the building/equipment are exposed to a maximum of 1,500 BTU/hr. ft\(^2\), and are assumed to be provided with a means to escape to a shielded area within three minutes, including the case of a 30 ft./sec. wind.
- d. Designs seeking to achieve greater radiant exposures to noncombustible equipment shall be designed in accordance with accepted engineering practice.
- e. The analysis reflected in this table does not permit hydrogen air mixtures would to exceed one-half of the lower flammable limit (LFL) for hydrogen (2 percent by volume) at the building or equipment, including the case of a 30 ft./sec. wind.

**2209.7.2 Minimum rate of discharge.** The minimum rate of discharge of pressure relief devices on the hydrogen storage tanks shall be in accordance with CGA S-1.3—except for the provision in 2209.7.3, or the ASME Boiler and Pressure Vessel Code, as applicable.

**2209.7.3 Vent pipe flow rates.** Where above ground storage of flammable or combustible liquids occurs and the tanks are diked, or no above ground storage of flammable or combustible liquids exists, the sizing of the maximum flow for the vent pipe need not include the vent flow as a result of an “engulfing fire” of the hydrogen storage tanks. The pressure relief valve(s) on the gaseous hydrogen storage tanks shall be sized to accommodate a hydrogen compressor that fails to shutdown or unload as a minimum.

**Proponent’s Reason: Introduction.** Hydrogen energy safety is based on three primary elements: regulatory requirements, capability of safety technology and the systemic application of equipment and procedures to minimize risks. Groups involved in the industrial scale production of hydrogen (producers) currently implement many successful proprietary methodologies for safely generating and handling large amounts of hydrogen. Hydrogen users (e.g., NASA) depend on cryo-hydrogen as a fuel and have effectively proven the safety of large scale ground and vehicle systems which support the Space Shuttle Program.

The efforts of the International Code Council Ad Hoc Committee for Hydrogen Gas (AHC) intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and hydrogen gas motor- vehicle fuel dispensing and generation stations. The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes. This, and other, related proposals is a summation of their work.

**Proposed NEW IFC Section 2209.** The United States Department of Energy
code to produce electricity and in some cases co-generate heat. Typically, refueling and generating stations within the scope of the International Fire Code and existing provisions of IFC Chapter 30, and inclusive of the more specific requirements detailed in this proposal clearly define gaseous hydrogen refueling and generating stations within the scope of the International Fire Code. In many cases the hydrogen fuel is utilized, with air, within a fuel cell to produce electricity and in some cases co-generate heat. Typically, building officials will be faced with two classes of equipment – those that generate hydrogen (for use by other devices) and those that utilize hydrogen as their energy input. In many cases, hydrogen will be utilized in a manner similar to the current use of natural gas. However, there are two important differences that cause the requirement to amend the ICC codes. First, both hydrogen and natural gas are lighter than air, but hydrogen is lighter than natural gas and is both more diffusive and more buoyant than natural gas. This means that in well-ventilated situations (e.g., outdoors) hydrogen will dissipate more quickly than natural gas, and much more quickly than either propane or gasoline, both of which have fumes that are heavier than air and will linger at an accident site. However, hydrogen and natural gas can both accumulate in unventilated pockets at the top of indoor structures and could represent a risk in such situations. Similarly, propane and gasoline fumes can accumulate at the floor level in unventilated spaces, posing a different risk. Thus ignition sources must be averted at the top of any unventilated spaces for hydrogen and natural gas, while ignitions sources must be precluded near the floor for gasoline or propane vehicles indoors. Second, hydrogen is odorless, colorless and burns with a flame that is not visible to the human eye. This means that it is unlikely that people will be able to detect unsafe conditions (without appropriate instrumentation) if they develop (similar to CO accumulation in a structure). It is essential that the ICC provide code officials with the necessary tools so that they can continue to ensure public safety as the public sector begins to adopt sources of hydrogen within the energy infrastructure. Therefore, the AHC has detailed a foundation for code requirements which will allow the safe handling and use of hydrogen as a fuel. Throughout their work, the AHC has sought consistency with existing codes and standards wherever possible. Where hydrogen standards in place today, do not cover the full scope of use or range of available or anticipated technologies, the AHC actively worked with a diverse group of technical and advisory parties from industry to establish criteria in the model codes to cover the installation and integration of these technologies with the building or facilities with which they are associated.

It is important to note that a given volume of natural gas has more than three times the energy of the same volume of hydrogen. Therefore, a given volume of pipe containing natural gas will contain the same energy (potential hazard) as a three times larger volume of hydrogen. The AHC intends that the term “refueling” be interpreted similarly to that defined in the IFC. However, it is not the intent to allow gaseous hydrogen vapors to escape during the refueling operation. Therefore, the AHC supports an approach to interpretation similar to that taken by such standards as ANSI/IAS NGV4.1-1999, NGV Dispensing Systems, NFPA 58-1998, Liquefied Petroleum Gas Code for LPG vehicles, and ANSIZ22.1, Fuel Gas Code for CNG vehicles, when defining the transfer of fuel at the refueling interface.

IFC Section 2209.2. Faced with an ever emerging stream of innovative materials and design methodologies for the use and handling of hydrogen, and the lack of any singular set of established criteria to evaluate, assess or certify specific equipment and components for hydrogen use, the AHC has proposed language not unlike what currently exists in the IFC regarding General Requirements for systems, equipment and processes (IFC Section 2703). Therefore, the AHC endorses a position where caution is exercised when considering the approval of what—for the time being—may be unlabeled and unlabeled equipment used for the storage, generation, compression or dispensing of hydrogen. As with any unlabeled appliance or piece of equipment, approval must be based upon documentation that demonstrates compliance with the appropriate standards and, where no product standards exist, that the appliance is appropriate for the intended use, and will provide the same level of performance as would be provided by a listed and labeled equivalent. The AHC still holds to the fundamental principle of the code where reliance upon the listing and labeling process assures performance, and approvals granted on an “Alternative” basis must be well justified with supporting documentation.

IFC Section 2209.2.1. Design requirements for storage vessels, containers, pressure vessels, cylinders, pressure relief devices, including pressure valves, hydrogen vaporizers, pressure regulators and piping used for hydrogen are directly dependent on the type, conditions of use and quantity of material involved. This section is intended to rely on design requirements for this equipment as referenced in the General Requirements of Chapter 27 and as referenced throughout the International Fire Code. Both the design and construction requirements must be approved by the code official where a specific standard is not referenced.

IFC Section 2209.2.2. Similar to associated piping, hoses, hose connections, compressors, hydrogen generators, dispensers, detection systems and electrical equipment used for hydrogen service must be built to approved standards and compatible with the material handled. The ASME B31.3, Code for Chemical Plant and Petroleum Refinery Piping or CGA G-5.4, Standard for Hydrogen Piping Systems at Consumer Locations which references ASME B31.3 may be appropriate for design and construction of the piping involved in hydrogen service, and are examples of common standards employed by industry for piping, tubing and associated distribution equipment involving hazardous materials. Though not specifically referenced here, there are other ASME and industry standards providing further guidance and considered appropriate for many aspects of gaseous and liquefied hydrogen systems.

IFC Section 2209.3. The goal of these provisions is to never permit the maximum concentration of flammable contaminants in air to exceed more than 25% of the LFL for hydrogen during the period that a credible leak exists. This can be accomplished using natural or mechanical ventilation, but always to assure adequate ventilation to prevent a hazardous buildup of hydrogen gas in buildings or confined spaces (i.e., underground vaults).

While the opportunity exists for integrated safety features that may reduce the risk involved without the need to install additional apparatus on site emerging technologies will require careful installation in accordance with manufacturer’s instructions to ensure the level of safety designed. Accordingly, the AHC has proposed several alternatives to minimize the risk of a hydrogen incident until the technology matures. To the extent that these safety devices become commonplace, the proposed language gives the code official the necessary information to approve and locate generation, compression, storage and dispensing equipment installations.

As identified in Exception Four; Two thousand standard cubic feet of hydrogen is roughly the equivalent quantity of hydrogen stored in one vehicle, and these vehicles will be distributed everywhere and operating without limitations.

In developing the criteria for minimum separation distances depicted in IFC Table 2209.3.1.1, the AHC consulted with hydrogen producers, and their corresponding gas and equipment group—engineering safety departments. The AHC also sought consistency with existing codes and standards wherever possible and in the best interest to safety personnel, fire departments, code officials and other emergency personnel. This included a review of the National Fire Protection Association’s Standard for Gaseous Hydrogen Systems at Consumer Sites (NFPA 50A), Standard for Liquefied Hydrogen Systems at Consumer Sites (NFPA 50B), and Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems (NFPA 52). (See discussion to
fuel dispensing and generation

It is this realization that further demonstrates the need for the efforts of the AHC for Hydrogen Gas as they intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and motor-vehicle fuel dispensing and generation stations. The vision of such fuel dispensing and generation stations will likely take form and function as a "self-sustaining" facility, capable of operating independently of other energy sources for two to three days at a time, using fuel stored in an underground tank. A 5-kW (AC) stationary fuel cell power plant would use natural gas, hydrogen or naphtha fuel, to supply the station with its electricity. In the event of a natural disaster, such as an earthquake, hurricane, tornado or flood, these stations will be able to supply hydrogen, oil or even gasoline for emergency operations and other critical use needs.

ICF Section 2209.4. This provision provides commensurate regulations for the use (dispensing) of gaseous hydrogen. The dispensing facility operators shall demonstrate minimum competent control of the dispensing of hydrogen including training and supervision for the employees and operators that use and maintain the system.

ICF Section 2209.5. To prevent spillage and to allow servicing of equipment a remote accessible manual shutoff valve must be installed. This valve is independent of the emergency shutdown equipment required in Section 2209.6.

ICF Section 2209.6. Two emergency shutdown devices must be installed, one in the compressor area and the other no closer than 25 feet (7620 mm) nor farther than 75 feet (22 860 mm) from the dispenser. These devices must shut down the power supply to the compressor and close the valves leading to and from the compressor and those between the storage containers and the dispensers in the event of an emergency. In fact, the gaseous hydrogen system may be located more than 300 ft. from the dispensing operation, but activation of any one device would activate total shutdown of all generation and dispensing operations on site.

ICF Section 2209.7 and Subsections. Emergency venting will ensure that there are no excessive builds of pressure in the system and that the gas will be vented to the outside. In developing provisions for the venting of hydrogen systems the AHC consulted with hydrogen producers, and their corresponding gas and equipment group—engineering safety departments. In general, four general hydrogen design considerations are included in the design of all hydrogen process vents piping: 1) Vent to a safe area, 2) Ignition likely, 3) Design for thermal radiation flame, and 4) Design to prevent (un-ignited) flammable mixtures from reaching personnel areas and ignition sources. While these considerations are general in nature and intended for use by designers, fabricators, installer, users and maintainers of hydrogen piping systems, the AHC also sought consistency with existing codes and standards wherever possible and in the best interest to safety personnel, fire departments, code officials and other emergency personnel. This included a review of the Compressed Gas Association's Standard for Hydrogen Piping Systems at Consumer Locations, CGA G-5.4. CGA G-5.4 specifies that piping systems should be designed in accordance with ASME B31.3, Chemical Plant and Petroleum Refinery Piping.

2209.1 General. Hydrogen motor-vehicle fuel dispensing and generation stations shall be in accordance with this section and Chapter 30. Where a fuel dispensing station also includes a repair garage, the repair operation shall comply with the requirements of this chapter for repair garages.

2209.1.1 Protection from vehicles. Guard posts or other approved means shall be provided to protect hydrogen storage systems; and use areas subject to vehicular damage in accordance with Section 312.

2209.2 Approvals. Equipment used for the storage, generation, compression or dispensing of hydrogen shall be designed for the specific application in accordance with Section 2209.2.1 and Section 2209.2.2.

2209.2.1 Approved equipment. Storage vessels, containers, pressure vessels, cylinders, pressure relief devices, including pressure valves, hydrogen vaporizers, pressure regulators and piping used for gaseous

Table 2209.3.1.1 included in the body of the proposed table and also reasons to IFC Section 2209.7 and Subsections

Note that both NFPA 50A and 50B are limited in scope as they apply to gaseous and liquefied hydrogen systems for which the hydrogen supply to the consumer site originates outside the consumer premises (i.e., as delivered by mobile equipment). The standards therefore, do not apply to hydrogen dispensing and generation stations operated by a hydrogen supplier or the supplier’s agent for the purpose of storing hydrogen and re-filling portable containers, trailers, mobile supply trucks, tank cars or motor vehicles.

In fact, the gaseous hydrogen system may be located more than 300 ft. from the dispensing operation, but activation of any one device would activate total shutdown of all generation and dispensing operations on site.

In summary. The AHC has developed these changes through the consultation of a diverse group of technical and advisory parties from a variety of interests representing the hydrogen community, inclusive of industry, professional associations, testing laboratories, agencies of government, academic and research institutions and believes it important to provide a template for thorough coverage in the International Codes of equipment, appliances and vehicles that will utilize hydrogen as a fuel. The effort affords regulators a sound technical basis on which to verify installation and to uphold the standard of health and safety for the citizens of their jurisdictions. Industry is ready to commercialize systems fueled predominantly using hydrogen energy. The AHC urges your approval of this proposal as submitted.

Committee Action: Approved as Modified

Modify proposal as follows:

SECTION 2209

HYDROGEN MOTOR-VEHICLE FUEL DISPENSING AND GENERATION STATIONS

2209.1 General. Hydrogen motor-vehicle fuel dispensing and generation stations shall be in accordance with this section and Chapter 30. Where a fuel dispensing station also includes a repair garage, the repair operation shall comply with the requirements of this chapter for repair garages.
hydrogen systems shall be designed and constructed in accordance with Section 2703, NFPA 50A and NFPA 50B.

**2209.2.2 Listed equipment.** Hoses, hose connections, compressors, hydrogen generators, dispensers, detection systems and electrical equipment used for hydrogen shall be listed for use with hydrogen. Hydrogen motor vehicle-fueling connections shall be listed and labeled for use with hydrogen.

**2209.3 Location of dispensing operations and equipment.**

Generation, compression, storage and dispensing equipment shall be located outdoors, above ground.

**Exceptions:**

1. Generation, compression, storage or dispensing equipment in buildings of noncombustible construction, as set forth in the International Building Code, which are unenclosed for three quarters or more of the building perimeter.

2. Indoor hydrogen generation, compression, storage and dispensing equipment designed and constructed in accordance with Chapter 30. Such indoor locations shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in accordance with Section 2210.7.

3. Gaseous hydrogen storage equipment installed in vaults as constructed in accordance with the applicable requirements of Chapter 34 and meeting all of the requirements of Section 2209.3.1. Where fully or partially enclosed, such locations shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in accordance with Section 2210.7.


**2209.3.1 Location on property.** In addition to the requirements of Section 2203.1, generators, compression, storage and dispensing equipment shall be located in accordance with Sections 2209.3.1.1 through Section 2209.3.1.5

**2209.3.1.1 Outdoor exposures.** Outdoor exposures shall require spacing to other fuels, buildings, public areas, or equivalent risks to life safety in accordance with Table 2209.3.1.1.

**Exceptions:**

1. Hydrogen storage, compression, generation equipment located in fully enclosed, underground vaults located no less than ten feet (10 ft.) from a lot line and constructed in accordance with Exception 3 to Section 2209.3.

2. Closed systems of 3,000 scf hydrogen or less.

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**TABLE 2209.3.1.1**

<table>
<thead>
<tr>
<th>SITE FEATURE</th>
<th>DISTANCE (feet)</th>
<th>REASON (Origin or Derivation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building—Noncombustible walls, sprinklered or nonsprinklered</td>
<td>10</td>
<td>NFPA 50A—10 ft.</td>
</tr>
<tr>
<td>Building—Combustible walls, sprinklered or nonsprinklered</td>
<td>25”</td>
<td>NFPA 50A—10 ft. (for greater than 15,000 scfm storage)</td>
</tr>
<tr>
<td>Building—Noncombustible walls, 2-hour fire barrier interrupts line-of-sight</td>
<td>5</td>
<td>—</td>
</tr>
<tr>
<td>Offsite sidewalks and on-site/off-site parked vehicles</td>
<td>15”</td>
<td>NFPA 50A—10 ft. (reasonable interpretation)</td>
</tr>
<tr>
<td>Lot line</td>
<td>10”</td>
<td>NFPA 50A—5 ft., NFPA 52—10 ft.</td>
</tr>
<tr>
<td>Air intake openings</td>
<td>25”</td>
<td>NFPA 50A—50 ft.</td>
</tr>
</tbody>
</table>
**Wall openings located less than 25 ft. vertically above** | 20 ft. | NFPA 50A | 10 ft. |
---|---|---|---|
**Wall openings located greater than 25 ft. vertically above** | 25 ft. | NFPA 50A | 25 ft. |
**Outdoor public assembly** | 25 ft. | NFPA 50A | 50 ft. |
**Ignition source** | 10 ft. | NFPA 50A | 10 ft. |
Flammable or combustible liquid storage—Above ground, diked in accordance with Section 3404.2.9.6. | 20 ft. | **Diking is advantageous:** |
Flammable or combustible liquid storage—Above ground, not diked | 50 ft. | NFPA 50A | 50 ft. |
Flammable or combustible liquid storage—Below ground, vent or fill opening | 20 ft. | NFPA 50A | 20 ft. |
Flammable gas storage (non-hydrogen)—Above ground, with common shutoff | 25 ft. | — |
Flammable gas storage (non-hydrogen)—Above ground, no common shutoff | 50 ft. | **A common shutoff system is advantageous:** |
Combustible waste material (see Section 304.1.1) | 50 ft. | **These materials should not be present presuming the code’s General Precautions Against Fire are adhered to:** |
Liquefied hydrogen storage—Distance to buildings, openings, lot lines, public ways and on-site/off-site parked vehicles | 25 ft. | NFPA 52 criteria |

For SI: 1 foot = 304.8 mm.

- A reduction to 5ft. shall be permitted where a 2-hour fire barrier interrupts the line of sight between the equipment and the exposure. The height of the barrier for vertical tanks shall be no less than one-third of the height of the tank measured vertically, and the length of the wall shall be 1.5 times the maximum diameter of the tank. The height of the barrier for vertical tanks shall be no less than one-third of the height of the tank measured vertically, and the length of the wall shall be 1.5 times the maximum diameter of the tank.
- A reduction to 0 ft. shall be permitted for dispensing equipment and vehicles being refueled.
- Measured along the natural and unobstructed line of travel (e.g., around protective walls, around corners of buildings)
- ignition source. A flame, spark or hot surface capable of igniting flammable vapors or fumes. Such sources include appliance burner igniters and hot work such as welding and open flames.
- For storage volume greater than or equal to 15,000 scf.

### 2209.3.1.2 Electrical classification
Such installations shall also follow provisions of the National Electrical Code NFPA 70 and applicable provisions of NFPA 497A.

### 2209.3.1.3 Overhead lines
The proximity to overhead lines shall be as follows:
- Not less than fifty feet (15.2m) from the vertical plane below the nearest overhead wire of an electric trolley, train or bus line; and
- Not less than five feet (1524 mm) from the vertical plane below the nearest overhead electrical wire.

### 2209.3.1.4 Canopies
Dispensing equipment need not be separated from canopies that are constructed in accordance with the International Building Code, in a manner that would prevent the accumulation of hydrogen gas.

### 2209.3.1.5 Rooftop locations
Gaseous hydrogen generation and storage equipment located on the roofs of buildings shall be supported on masonry, concrete, steel or other approved noncombustible construction; provided that, where such supports are located in the building, the supports shall be afforded a fire resistance rating of 2 hours, but not less than that required by the building type of construction. The roof assembly directly under such equipment shall also be afforded a fire resistance rating of 2 hours, but not less than that required by the building type of construction. Roof-top air intakes shall be at least 15 feet from hydrogen storage equipment, be located no higher than the equipment, and shall face away from the equipment. Approved signage having 1 inch (25 mm) block letters shall be affixed at a conspicuous location on the building exterior stating: **ROOF TOP HYDROGEN GENERATION AND/OR STORAGE.**

### 2209.4 Private fueling of motor vehicles
Self-service hydrogen-dispensing systems, including key code and card-locked dispensing systems, shall be limited to the filling of permanently mounted fuel containers on hydrogen-powered vehicles.

In addition to the requirements in Section 2210, the owner of a self-service hydrogen-dispensing facility shall provide for the safe operation of the system through the institution of a fire safety plan submitted in accordance with Section 404, the training of employees and operators who use and maintain the system in accordance with Section 406, and provisions for hazard communication in accordance with Section 407.

### 2209.5 Valves
Piping to equipment shall be provided with a, readily accessible manual shut-off valve that is readily identifiable.

### 2209.6 Emergency shutdown
Emergency shutdown devices shall be located within 75 feet (22860 mm) of, but not less than 25 feet (7620 mm) from, dispensers and hydrogen generators, and shall also be provided in the compressor area. Upon activation, emergency shutdown shall automatically shut off the power supply to all hydrogen storage, compression, dispensing and generating equipment, shut off natural gas or other fuel supply to the hydrogen generator, and close valves between the main supply and the compressor and between the storage containers and dispensing equipment.

### 2209.7 Emergency venting of hydrogen systems
Hydrogen systems shall be equipped with venting that will relieve excessive internal pressure. Hydrogen systems shall not discharge inside buildings. All portions of the system shall be protected by pressure relieving devices.

### 2209.7.1 Vent pipe
A vent pipe that will divert the gas flow to atmosphere shall be installed on the vessel for purging operations. The vent pipe shall be designed and constructed as follows:
1. The piping shall be constructed of pipe or tubing materials approved for hydrogen service in accordance with ASME B31.3 for the rated pressure, volume and temperature. The vent piping shall be designed for the maximum back pressure within the pipe, but not less than 335 psig.

2. The vent pipe shall be properly supported and shall be provided with a rain cap or other feature which would not limit or obstruct the gas flow from venting vertically upward.

3. A means shall be provided to prevent water, ice and other debris from accumulating inside the vent pipe or obstructing the vent pipe.

4. Venting of hydrogen gases shall be as follows:

   4.1 The height (H) and separation distance (D) of the vent pipe shall meet the criteria set forth in Table 2209.7.1 for the combinations of maximum hydrogen flow rates and vent stack opening diameters listed; or

   4.2 The maximum emergency purging flow rate shall be specified for verification by the authority having jurisdiction. The maximum emergency purging flow rate shall be the pressure relief device release rate in accordance with CGA S-1.3 for a non-engulfing flame or the maximum on-site production rate, whichever is larger.

   4.3 Where alternative venting arrangements are proposed, an analysis of radiant heat exposures shall be provided showing (in a 30 ft./sec wind); exposures to employees are limited to no more than 1,500 Btu/hr ft² for a maximum of three minutes, exposures to noncombustible equipment are limited to no more than 8,000 Btu/hr ft², exposures simulated at the property line are limited to no more than 500 Btu/hr ft² and that no equipment or personnel within D or H, or any property line within 1.25 D would be exposure to more than one-half of the lower flammable limit (LFL) for hydrogen (2 percent by volume).

5. At the connection fitting of the vent pipe and the hydrogen cylinder, a listed bi-directional detonation flame arrester shall be provided.

<table>
<thead>
<tr>
<th>TABLE 2209.7.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN VENT STACK HEIGHT (H) VERSUS DISTANCE (D) REQUIREMENTS</td>
</tr>
</tbody>
</table>

H = Minimum height of vent stack above the ground or above any structure/equipment within distance D where personnel may be present (ft.).
D = Distance to adjacent structure/equipment where personnel may be present (ft.).

<table>
<thead>
<tr>
<th>HEIGHT AND SEPARATION DISTANCE a, b, c, d, e</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERSUS HYDROGEN FLOW RATE AND VENT PIPE DIAMETER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCFM</th>
<th>Vent Dia (in.)</th>
<th>SCFM</th>
<th>Vent Dia (in.)</th>
<th>SCFM</th>
<th>Vent Dia (in.)</th>
<th>SCFM</th>
<th>Vent Dia (in.)</th>
<th>SCFM</th>
<th>Vent Dia (in.)</th>
<th>SCFM</th>
<th>Vent Dia (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-500</td>
<td>1</td>
<td>500-1000</td>
<td>2</td>
<td>1,000-2,000</td>
<td>2</td>
<td>2,000-5,000</td>
<td>2</td>
<td>5,000-10,000</td>
<td>3</td>
<td>10,000-20,000</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
<td>8</td>
<td></td>
<td>12</td>
<td></td>
<td>12</td>
<td></td>
<td>17</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td></td>
<td>15</td>
<td></td>
<td>22</td>
<td></td>
<td>26</td>
<td></td>
<td>39</td>
<td></td>
<td>53</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

a. Minimum distance to property line is 1.25D.
b. Designs seeking to achieve greater heights with commensurate reductions in separation distances shall be designed in accordance with accepted engineering practice.
c. With this table personnel on the ground or on the building/equipment are exposed to a maximum of 1,500 BTU/hr. ft², and are assumed to be provided with a means to escape to a shielded area within three minutes, including the case of a 30 ft./sec. wind.
d. Designs seeking to achieve greater radiant exposures to noncombustible equipment shall be designed in accordance with accepted engineering practice.
e. The analysis reflected in this table does not permit hydrogen air mixtures would to exceed one-half of the lower flammable limit (LFL) for hydrogen (2 percent by volume) at the building or equipment, including the case of a 30 ft./sec. wind.

VENT STACK

2209.7.2 Minimum rate of discharge. The minimum rate of discharge of pressure relief devices on the hydrogen storage tanks shall be in accordance with CGA S-1.3—except for the provision in 2209.7.3, or the ASME Boiler and Pressure Vessel Code, as applicable.

2209.7.3 Vent pipe flow rates. Where above ground storage of flammable or combustible liquids occurs and the tanks are diked, or no above ground storage of flammable or combustible liquids exists, the sizing of the maximum flow for the vent pipe need not include the vent flow as a result of an “engulfing fire” of the hydrogen storage tanks. The pressure relief valve(s) on the gaseous hydrogen storage tanks shall be sized to accommodate a hydrogen compressor that fails to shutdown or unload as a minimum.

Committee Reason: The code change is needed to address new technology that is already being used.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Larry Fluer and Kevin Scott, Fluer, Inc. and Kern County California Fire Department, respectively, representing Compressed Gas Association and Kern County Fire Department, respectively, request Approved as Modified by this Public Comment.

Modify proposal as follows:

SECTION 2209

2002 ICC FINAL ACTION AGENDA
shall be separated from other fuels, buildings, public areas, or equivalent risks to life safety in accordance with Table 2209.3.1.1.

Exceptions:

1. Hydrogen storage, compression, generation equipment located in fully enclosed, underground vaults located no less than ten feet (10 ft.) from a lot line and constructed in accordance with Exception 3 to Section 2209.3.

2. Closed systems of 3,000 scf hydrogen or less.
TABLE 2209.3.1.1

EQUIPMENT OR FEATURE MINIMUM SEPARATION FOR GASEOUS HYDROGEN DISPENSERS, COMPRESSORS, GENERATORS

<table>
<thead>
<tr>
<th>SITE FEATURE</th>
<th>DISTANCE (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building—Noncombustible walls, Types I and II construction, sprinklered or nonsprinklered</td>
<td>10</td>
</tr>
<tr>
<td>Building—Combustible walls, Types III, IV or V construction, sprinklered or nonsprinklered</td>
<td>25</td>
</tr>
<tr>
<td>Building—Noncombustible walls, 2-hour fire barrier interrupts line-of-sight</td>
<td>5</td>
</tr>
<tr>
<td>Offsite sidewalks and on-site/off-site parked vehicles</td>
<td>15 b</td>
</tr>
<tr>
<td>Lot line</td>
<td>10 a</td>
</tr>
<tr>
<td>Air intake openings</td>
<td>25</td>
</tr>
<tr>
<td>Wall openings located less than 25 ft. vertically above grade</td>
<td>20 a</td>
</tr>
<tr>
<td>Wall openings located greater than 25 ft. vertically above grade</td>
<td>25</td>
</tr>
<tr>
<td>Outdoor public assembly</td>
<td>25 a</td>
</tr>
<tr>
<td>Ignition source</td>
<td>40</td>
</tr>
<tr>
<td>Flammable or combustible liquid storage or use—Above ground, diked in accordance with Section 3404.2.9.6.</td>
<td>20</td>
</tr>
<tr>
<td>Flammable or combustible liquid storage or use—Above ground, not diked in accordance with Section 3404.2.9.6</td>
<td>50</td>
</tr>
<tr>
<td>Flammable or combustible liquid storage—Below ground, from vent or fill opening</td>
<td>20</td>
</tr>
<tr>
<td>Flammable gas storage (non-hydrogen)—Above ground, with common shutoff</td>
<td>25</td>
</tr>
<tr>
<td>Flammable gas storage (non-hydrogen)—Above ground, no common shutoff</td>
<td>50</td>
</tr>
<tr>
<td>Combustible waste material (see Section 304.1.1)</td>
<td>50</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

a. A reduction to 5 ft. shall be permitted where a 2-hour fire barrier interrupts the line of sight between the equipment and the exposure. The height of the barrier for vertical tanks shall be no less than one third of the height of the tank measured vertically, and the length of the wall shall be 4.5 times the maximum diameter of the tank. The height of the barrier for vertical tanks shall be no less than one third of the height of the tank measured vertically, and the length of the wall shall be 1.5 times the maximum diameter of the tank.

b. A reduction to 0 ft. shall be permitted for dispensing equipment and vehicles being refueled.

c. Measured along the natural and unobstructed line of travel (e.g., around protective walls, around corners of buildings)

d. Ignition source: A flame, spark or hot surface capable of igniting flammable vapors or fumes. Such sources include appliance burner igniters and hot work such as welding and open flames.

e. For storage volume greater than or equal to 15,000 scf.

2209.3.1.2 Cylinders, containers and tanks used for storage. Cylinders, container and tanks used for storage of hydrogen shall be separated from exposures in accordance with NFPA 50A or 50B.

2209.3.1.3 Electrical classification. Such installations shall also follow provisions of the National Electrical Code NFPA 70. Electrical wiring and equipment shall be installed and maintained in accordance with the International Electrical Code and applicable provisions of NFPA 497A.

2209.3.1.4 Overhead lines. The proximity to Generation, compression, storage and dispensing equipment shall be separated from overhead lines shall be as follows:

a. Not less than fifty feet (15.2m) from the vertical plane below the nearest overhead wire of an electric trolley, train or bus line; and

b. Not less than five feet (1.524 m) from the vertical plane below the nearest overhead electrical wire.

2209.3.1.5 Canopies. Dispensing equipment need not be separated from canopies that are. Where overhead noncombustible construction is provided for sheltering outdoor dispensing areas, such dispensing shall not be considered indoors when the area is constructed in accordance with the International Building Code Section 414.6.1, in a manner that would prevent the accumulation of hydrogen gas.

2209.4 Private fueling of motor vehicles. Self-service hydrogen-dispensing systems, including key code and card-locked dispensing systems, shall be limited to the filling of permanently mounted fuel containers on hydrogen-powered vehicles.

In addition to the requirements in Section 2210, the owner of a self-service hydrogen-dispensing facility shall provide for the safe operation of the system through the institution of a fire safety plan submitted in accordance with Section 404, the training of employees and operators who use and maintain the system in accordance with Section 406, and provisions for hazard communication in accordance with Section 407.

2209.5 Emergency shutoff valves. Piping to equipment shall be provided with a. A readily accessible manual emergency shut-off valve that is readily identifiable shall be provided to shut down the gas supply to the piping system.

2209.5.1 Marking. Emergency shutoff valves shall be marked so as to be readily identifiable.

2209.6 Emergency shutdown controls. A remotely activated emergency shutdown control shall be provided. Emergency shutdown devices controls shall be located within 75 feet (22860 mm) of, but not less than 25 feet (7620 mm) from, dispensers, hydrogen generators, and compressors. Upon activation, emergency shutdown shall automatically shut off the power supply to all hydrogen storage, compression, dispensing and generating equipment, shut off natural gas or other fuel supply to the hydrogen generator, and close valves between the main supply and the compressor and between the storage containers and dispensing equipment.

2209.6.1 System Requirements. Upon activation, emergency shutdown shall automatically shut off the power supply to hydrogen storage, compression, dispensing and generating equipment, shut off natural gas or other fuel supply to the hydrogen generator, and close valves between the main supply and the compressor and between the storage containers and dispensing equipment.
2209.7 Emergency venting of hydrogen systems. Hydrogen systems shall be equipped with venting that will relieve excessive internal pressure. Hydrogen systems shall not discharge inside buildings. All portions of the system shall be protected by pressure relieving devices.

2209.7.1 Pressure relief. Portions of the piping system subject to overpressure shall be protected by pressure relieving devices.

2209.7.2 Discharge. Hydrogen venting systems shall not discharge inside buildings or under canopies used for weather protection.

2209.7.3 Installation. Pressure relief devices used to protect cylinders, containers and tanks used for the storage of liquefied or gaseous hydrogen shall be designed and installed in accordance with the requirements of CGA S-1.1, S-1.2 or S-1.3.

2209.7.4 Vent pipe. When vent pipes that will divert the gas flow to atmosphere shall be installed on the vessel for purging operations, the vent pipes shall be designed and constructed as follows:

1. The piping shall be constructed of pipe or tubing materials approved for hydrogen service in accordance with ASME B31.3 for the rated pressure, volume and temperature. The vent piping shall be designed for the maximum back pressure within the pipe, but not less than 335 psig.

2. The vent pipe shall be properly supported and shall be provided with a rain cap or other feature which would not limit or obstruct the gas flow from venting vertically upward.

3. The vent pipe shall be located away from obstructions that would obstruct the gas from dispersing vertically upward.

2-4. A means shall be provided to prevent obstructions or restrictions to the design capacity of the vent pipe due to water, ice and other debris from accumulating inside the vent pipe or by placing restrictions into the vent pipe system that would alter the design capacity.

45. Venting of hydrogen gases shall be as follows: The height (H) and separation distance (D) of the vent pipe shall meet the criteria set forth in Table 2209.7.4 for the combinations of maximum hydrogen flow rates and vent stack opening diameters listed:

4.1 The height (H) and separation distance (D) of the vent pipe shall meet the criteria set forth in Table 2209.7.4 for the combinations of maximum hydrogen flow rates and vent stack opening diameters listed:

4.2 The maximum emergency purging flow rate shall be specified for verification by the authority having jurisdiction. The maximum emergency purging flow rate shall be the pressure relief device release rate in accordance with CGA S-1.3 for a non-engulfing flame or the maximum on-site production rate, whichever is larger.

4.3 Where alternative venting arrangements are proposed, an analysis of radiant heat exposures shall be provided showing (in a 30 ft./sec wind): exposures to employees are limited to no more than 1,500 Btu/hr-ft² for a maximum of three minutes, exposures to noncombustible equipment are limited to no more than 8,000 Btu/hr-ft², exposures simulated at the property line are limited to no more than 500 Btu/hr-ft² and that no equipment or personnel within D or H, or any property line within 1.25 D would be exposure to more than one half of the lower flammable limit (LFL) for hydrogen (2 percent by volume).

6. At the connection fitting of the vent pipe and the hydrogen cylinder, a listed bi-directional detonation flame arrester shall be provided.

6. When cylinders are used to supply the hydrogen system a listed bi-directional detonation flame arrester shall be provided at the point of connection to the vent line.
TABLE 2209.7.4
HYDROGEN VENT STACK HEIGHT (H) VERSUS DISTANCE (D) REQUIREMENTS

H = Minimum height of vent stack above the ground or above any structure/equipment within distance D where personnel may be present (ft.).
D = Distance to adjacent structure/equipment where personnel may be present (ft.).

<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>0-499 scfm</th>
<th>500-999 scfm</th>
<th>1,000-1,999 scfm</th>
<th>2,000-4,999 scfm</th>
<th>5,000-9,999 scfm</th>
<th>10,000-20,000 scfm</th>
</tr>
</thead>
<tbody>
<tr>
<td>H (ft.)</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>17</td>
<td>25</td>
<td>36</td>
</tr>
<tr>
<td>D (ft.)</td>
<td>13</td>
<td>17</td>
<td>26</td>
<td>40</td>
<td>53</td>
<td>81</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

a. Minimum distance to property lot line is 1.25D.
b. Designs seeking to achieve greater heights with commensurate reductions in separation distances shall be designed in accordance with accepted engineering practice.

c. With this table personnel on the ground or on the building/equipment are exposed to a maximum of 1,500 BTU/hr. ft², and are assumed to be provided with a means to escape to a shielded area within three minutes, including the case of a 30 ft./sec. wind.
d. Designs seeking to achieve greater radiant exposures to noncombustible equipment shall be designed in accordance with accepted engineering practice.
e. The analysis reflected in this table does not permit hydrogen/air mixtures would exceed one-half of the lower flammable limit (LFL) for hydrogen (2 percent by volume) at the building or equipment, including the case of a 30 ft./sec. wind.

2009.7.4.1 Alternative venting systems. Where alternative venting arrangements are proposed, an analysis of exposure to radiant heat and hydrogen concentrations shall be provided.

2009.7.4.1.1 Radiant Heat Exposure. The analysis of exposure to radiant heat shall assume a wind speed of 30 feet/second and provide a design that limits the maximum radiant heat exposure to the values in Table 2209.7.4.1.1.

Table 2209.7.4.1.1
Maximum Radiant Heat Exposure
2209.7.4.1.2 Hydrogen concentration exposure. The analysis of exposure to hydrogen concentration shall provide a design that limits the maximum hydrogen concentration exposure to the values in Table 2209.7.4.1.2.

### Table 2209.7.4.1.2

<table>
<thead>
<tr>
<th>Exposed Object</th>
<th>Maximum Hydrogen Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel, buildings or equipment</td>
<td>50% LFL within a distance of D and H of Table 2209.7.4</td>
</tr>
<tr>
<td>Lot line</td>
<td>50% LFL within 1.25 times the distance of D and H of Table 2209.7.4</td>
</tr>
</tbody>
</table>

Where alternative venting arrangements are proposed, an analysis of radiant heat exposures shall be provided showing (in a 30 ft./sec wind):

- exposures to employees are limited to no more than 1,500 Btuh/ft² for a maximum of three minutes, exposures to noncombustible equipment are limited to no more than 8,000 Btuh/ft², exposures simulated at the property line are limited to no more than 500 Btuh/ft², and that no equipment or personnel within D or H, or any property line within 1.25 D would be exposure to more than one-half of the lower flammable limit (LFL) for hydrogen (2 percent by volume).

2209.7.2 Minimum rate of discharge. The minimum rate of discharge of pressure relief devices on the hydrogen storage tanks shall be in accordance with CGA S-1.3 – except for the provision in 2209.7.3, or the ASME Boiler and Pressure Vessel Code, as applicable.

2209.7.3 Vent pipe flow rates. Where above ground storage of flammable or combustible liquids occurs and the tanks are diked, or no above ground storage of flammable or combustible liquids exists, the sizing of the maximum flow for the vent pipe need not include the vent flow as a result of an “engulfing fire” of the hydrogen storage tanks. The pressure relief valve(s) on the gaseous hydrogen storage tanks shall be sized to accommodate a hydrogen compressor that fails to shutdown or unload as a minimum.

Commenter’s Reason: 2209.1 has been revised to reference Chapter 35 rather than Chapter 30. Chapter 35 addresses flammable gases and is the appropriate reference in this general section. You still get to Chapter 30 because Section 3501.1 refers to Chapter 30.

2209.2.1 revised to bring consistency between this section and the general requirements of Chapters 30 and 32 regulating compressed and cryogenic gases. The use of the terms storage vessels and pressure vessels is not consistent with terms otherwise defined by the code.

2209.3.1.1 As currently drafted the section would require “exposures” to be separated from systems rather than requiring systems to be separated from exposure hazards which is the norm within the context of the code. The section has been revised to separate the system from the hazard. Siting of bulk storage has been the subject of regulation by national standards, e.g., NFPA 50A and 50B for many years. The distances required by the referenced standards vary depending on the capacity of the storage system. Recent testing and modeling of hydrogen releases from bulk systems suggests that the distances required by these standards may be modified. Member companies within the Compressed Gas Association are evaluating the required distances based on recent data. Until such time as the evaluation has been completed and justifications for change established the use of current standards should be maintained. The triggering language to the use of Table 2209.3.1.1 has been modified to limit the use of the table to generators, dispensers and compressors. Section 2209.3.1.2 has been added to refer to NFPA 50A and 50B for locating the “storage” systems.

2209.3.1.1 Exception #1 was deleted to correlate with committee action that removed the allowance to locate these facilities inside buildings.

Exception 2 has been deleted as it is in conflict with NFPA 50A and 50B as well as with the requirements of Chapter 35. Exempting 3,000 cubic feet of hydrogen from the requirements for exposure protection is not justified.

2209.3.1.2 was added to establish the point where measurements are to be taken. As originally submitted it may have focused on vent pipes from storage tanks. By deferring to NFPA 50A and B the focus now becomes compression and/or dispensing or generating equipment. The use of grade is appropriate as a means to establish the basis for measurement.

2209.3.1.3 was revised to clarify the items being addressed.

2209.3.1.4 was added to establish the point where measurements are to be taken. As originally submitted it may have focused on vent pipes from storage tanks. By deferring to NFPA 50A and B the focus now becomes compression and/or dispensing or generating equipment. The use of grade is appropriate as a means to establish the basis for measurement.

2209.5 was revised to clarify that the shutoff valve required is to serve as an emergency valve to isolate the supply from the system.

2209.5.1 was added to require the marking of the emergency shutoff valve required by Section 2209.5.
2209.6 was revised to clarify that the required device is a “control” rather than a valve, and that the control is to be designed to be accessed from a location outside of the immediate area where dispensing occurs. The operability requirements for the control have been extracted and relocated to a new Section 2209.6.1.  
2209.6.1 was added to separate the requirements for performance of the remote shut off control from the requirement of the control proper.  
2209.7 was revised to correlate with committee action which deleted inside locations. It was further altered to itemize specific items being required.  
2209.7.1 was extracted from 2209.7.  
2209.7.2 was extracted from 2209.7. Although dispensing is not permitted inside of buildings there is no provision to restrict a designer from taking a vent into a building or from venting under a canopy. By establishing a prohibition it clarifies the intent that vents remain external to buildings or canopies regardless of the location of the dispensing, generation, compression or storage equipment.  
2209.7.3 was extracted in part from 2209.7.1 item 4.2 and modified to add referenced standards that address cylinders, containers and tanks. These reference standards are included in Chapter 45 of the IFC. The criteria for fire exposure and overpressure venting are found in the standards for relief devices within CGA S-1.1 through S-1.3.  
2209.7.4 (formerly 2209.7.1) was revised to provide requirements for all vent pipes.  
2209.7.4 Item 2 was revised and split into Items 2 and 3. This separates the issue of providing a rain cap and the requirement to allow for vertical travel of the gas. A rain cap that will stop the rain will not allow for vertical travel of the gas. By separating the two issues it can be clarified.  
2209.7.4 Item 4.1 was revised by deleting “or” at the end of the sentence. All of the items in this list need to be complied with; it is not a choice of one or the other because Item 4.3 has been relocated.  
2209.7.4 Item 4.2 was deleted. Section 2209.7.3 sends the user to referenced standards regarding the application of vent system design for storage containers. Section 2209.7.4 and its related table provide the needed criteria to include all other vents.  
2209.7.4.1.1 was added to provide requirements for alternative venting systems. Sections 2209.7.4.1.1 and 2209.7.4.1.2 and their related tables were created from the content of Section 2209.7.1 item 4.3 as it appears in the Report of Public Hearings.  
2209.7.4 Item 5 was relocated to become Item 6.  
Table 2209.7.4 (Formerly Table 2209.7.1) was revised in several instances as follows:  
1. The duplicate headings were reduced to one heading.  
2. The legend for ‘H’ and ‘D’ was relocated to after the table.  
3. The entries on the Table have been simplified. In the majority of the cases it made little difference what size vent was installed, or it was only a matter of several feet difference. Therefore, the distances have been combined to make for easier application of the table.  
4. Footnotes and d were revised to refer to lot line rather than property line as lot line is that used within the ICC system.  
5. Footnote c has been deleted since it is explanatory information and not regulatory requirements.  

Public Comment 2:  
Kevin H. Scott, Kern County Fire Department, requests Approved as Modified by this Public Comment.  
This comment affects section numbers and titles only.  
Modify proposal as follows:  

SECTION 2209  
Hydrogen Motor Fuel Dispensing and Generation Stations  
2209.1 General.  
2209.2 Approvals Equipment.  
2209.2.1 Approved equipment.  
2209.2.2 Listed equipment.
them APPROVED as MODIFIED by this PUBLIC COMMENT (AMPC).

The exceptions proposed are intended for the purpose of clearly establishing provisions already allowed by other sections of the IBC and IFC. For example, the reference to NFPA 50A, *Gaseous Hydrogen Systems*, in IFC 3501.1 permits the installation of hydrogen systems indoors given special considerations for ventilation, type of construction and location of openings. Revised Exception 1 is written in language similar to that addressing weather protective canopies serving Natural Gas Vehicle (NGV) fuel-dispensing stations (IFGC 2208.3) and as set forth in IBC 406 for motor vehicle service station canopies. Exception 2 relates to the existing provisions within the code which allow up to the exempt amount of a flammable gas to be stored and/or used indoors. Additionally, where a maximum allowable quantity threshold in the IFC is exceeded, the proposed language would require the construction of the appropriate H occupancy to accommodate such indoor generation or refueling operations.

By eliminating these exceptions entirely, provisions for hydrogen gas could be interpreted as more restrictive than existing IFC/IBC code language which allows these operations to exist under canopies or indoors. Note also, that the dispensing of hydrogen to a vehicle is an entirely closed-transfer process, similar to current provisions for NGV fuel-dispensing operations, whereby no hydrogen is allowed to escape to the atmosphere. To minimize risk further, a coordinated proposal to IBC-G and the IFGC (see FG41-02, Items 1 & 3) requires installation of such equipment in HYDROGEN CUT-OFF ROOMS, with special considerations for ventilation, separation, type of construction and location of openings all in the interest of public safety.

The AHC has also addressed and resolved the technical issues identified by the IFGC Committee directly as modified by this and other coordinated public comments to all hydrogen-related proposals (F176, M7, FG2, FG15, FG41 & FG48). The supporting Reason to FG2-02 provides a brief explanation of each solution.

The ICC AHC for Hydrogen Gas requests your Approval as Modified by this Public Comment (AMPC).

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**F177-02**

**2210**

**Proposed Change as Submitted:**

**Proponent:** Guy Tomberlin, County of Fairfax; representing ICC Ad Hoc Committee for Hydrogen Gas

Add new text as follows and re-number remaining section numbers:

**SECTION 2210**

**REPAIR GARAGES**

2210.8 **Defueling of hydrogen from motor vehicle fuel storage containers.** The discharge or defueling of hydrogen from motor vehicle fuel storage tanks for the purpose of maintenance, cylinder certification, calibration of dispensers or other activities shall be in accordance with Section 2210.8.1

2210.8.1 **Methods of discharge.** The discharge of hydrogen from motor vehicle fuel storage tanks shall be accomplished through a closed transfer system in accordance with Section 2210.8.1.1 or an approved method of atmospheric venting in accordance with

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**Section 2210.8.1.2**

2210.8.1.1 **Closed transfer system.** A documented procedure that explains the logic sequence for discharging the storage tank shall be provided to the code official for review and approval. The procedure shall include what actions the operator will take in the event of a low-pressure or high-pressure hydrogen release during discharging activity. Construction documents shall be provided illustrating the arrangement of piping, regulators and equipment settings. The construction documents shall illustrate the piping and regulator arrangement and shall be shown in spatial relation to the location of the compressor, storage vessels and emergency shutdown devices.

2210.8.1.2 **Atmospheric venting of hydrogen from motor vehicle fuel storage containers.** The discharge of hydrogen from motor vehicle fuel storage tanks for the purposes of maintenance, cylinder certification, calibration of dispensers or other activities shall be in accordance with Sections 2210.8.1.2.1 through 2210.8.1.2.4.

2210.8.1.2.1 **Defueling equipment required at vehicle maintenance and repair facilities.** All facilities for repairing hydrogen systems on hydrogen vehicles will have a facility to defuel the vehicle storage tank(s). Vehicle storage tanks for defueling to a vent pipe shall be connected to the vent pipe by way of equipment supplied by the vehicle manufacturer. The rate of flow shall not exceed 1,000 scfm (2.5 kg/min) and shall be controlled via the supplied equipment, at low pressure and without adjustment. The vent pipe for defueling shall not be used for or flow into a vent pipe for any other purpose. The defueling vent pipe shall have a diameter of 1 inch and terminate in accordance with Section 2209.7.1: with a minimum height (H) of at least 8 ft, and a minimum distance (D) to exposures of 15 ft. The minimum design pressure of the vent piping shall be 335 psig.

2210.8.1.2.2 **Construction documents.** Construction documents shall be provided illustrating the location of the means for vessel support, piping, the method of grounding and bonding, and other requirements specified herein.

2210.8.1.2.3 **Tank and cylinder stability.** A method of rigidly supporting the vessel during the discharge or defueling of
hydrogen shall be provided. The selected method shall provide not less than two points of support and shall prevent the horizontal and lateral movement of the vessel. The system shall be designed to prevent the movement of the vessel based on the highest gas-release velocity through valve orifices at the vessel’s rated pressure and volume. The structure or appurtenance shall be constructed of noncombustible materials as set forth in the International Building Code.

2210.8.1.2.4 Grounding and bonding. The structure or appurtenance used for supporting the vessel shall be grounded in accordance with the ICC Electrical Code. The valve of the vehicle storage tank shall be bonded prior to the commencement of discharge or defueling operations.

2210.8.2 Repair of hydrogen piping. Piping systems containing hydrogen shall not be opened to the atmosphere for repair without first purging the piping with an inert gas to achieve one percent hydrogen or less by volume. Defueling operations and exiting purge flow shall be vented in accordance with Section 2210.8.1.2.

2210.8.3 Purging. Each individual manufactured component of a hydrogen generating, compression, storage, or dispensing system shall have a label affixed as well as a description in the installation and owner's manuals describing the procedure for purging air from the system during start-up, regular maintenance and for purging hydrogen from the system prior to disassembly (to admit air).

For the interconnecting piping between the individual manufactured components the pressure rating must be at least 20 times the absolute pressure present in the piping when any hydrogen meets any air.

[Example: hydrogen meets air in an interconnecting pipe at 3 psig. 3 psig is 17.5 psia. The minimum pressure rating of the pipe would have to be 20 x 17.5 = 350 psia or 335 psig.]

2210.8.3.1 System purge required. After installation, repair or maintenance, the hydrogen piping system shall be purged of air in accordance with the manufacturer’s procedure for purging air from the system.

Proponent’s Reason: Introduction. Hydrogen energy safety is based on three primary elements: regulatory requirements, capability of safety technology and the systemic application of equipment and procedures to minimize risks. Groups involved in the industrial scale production of hydrogen (producers) currently implement many successful proprietary methodologies for safely generating and handling large amounts of hydrogen. Hydrogen users (e.g., NASA) depend on cryo-hydrogen as a fuel and have effectively proven the safety of large scale ground and vehicle systems which support the Space Shuttle Program.

The efforts of the International Code Council Ad Hoc Committee for Hydrogen Gas (AHC) intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and hydrogen gas motor-vehicle fuel dispensing and generation stations. The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes. This, and other, related proposals is a summation of their work.

IFC Section 2210.8. Because of the emerging attraction of alternative fuels and the differences in their properties, repair garages must be designed for the anticipated vehicles and the materials fueling them. This section includes the provisions for many different fuels, including lighter-than-air fuels. Accordingly, if a repair garage makes hydrogen, a lighter-than-air fuel, available for dispensing to motor vehicles, the repair garage must also meet the applicable requirements and compensating hazard mitigation criteria for a repair garage servicing hydrogen-fueled vehicles.

IFC Section 2210.8.1. Under consultation with the Society of Automotive Engineers, the AHC has continued to monitor the progress of the Society’s Safety and Interface working groups as affiliated with SAE’s Strategic Alliance to Develop Fuel Cell Vehicle Standards. “Best practice” procedures under consideration by SAE and noted by the AHC in their recommendations include both General Vehicle (e.g., crash-worthiness, vehicle immersion, hazards leading to failure, common-mode failures, grounding locations, visual recognition of vehicles, etc.) and General Safety (e.g., design for leakage, detection of leakage, protection from debris, design of vents, short- vs. long-term parking scenarios, and underground/enclosed parking) criteria.

The SAE’s Safety Working Group intends to standardize the defueling connections on vehicles as well as the means to limit the defueling flow to 1,000 scfm at 5,000 psig storage pressure.

Provisions for limiting the use of the defueling vent pipe result from safety concerns and risk of backflow from any other venting into the defueling area.

The minimum vent pipe heights (H) and separation distances (D) will provide safe radiation levels and unignited hydrogen concentrations without ignition.

IFC Section 2210.8.3 places the burden of purging requirement on the equipment manufacturer. Commensurately, these requirements can be verified by the code official before, during and after installation. Requirements for rating the interconnecting piping at 20 times the initial pressure assures that a detonation will not rupture the vent piping.

In Summary. The AHC has developed these changes through the consultation of a diverse group of technical and advisory parties from a variety of interests representing the hydrogen community, inclusive of industry, professional associations, testing laboratories, agencies of government, academic and research institutions and believes it important to provide a template for thorough coverage in the International Codes of equipment, appliances and vehicles that will utilize hydrogen as a fuel. The effort affords regulators a sound technical basis on which to verify installation and to uphold the standard of health and safety for the citizens of their jurisdictions.

Industry is ready to commercialize systems fueled predominantly using hydrogen energy. The AHC urges your APPROVAL of this proposal “as submitted”.

Committee Action: Approved as Modified
Modify proposal as follows:

SECTION 2210
REPAIR GARAGES
2210.8 Defueling of hydrogen from motor vehicle fuel storage containers. The discharge or defueling of hydrogen from motor vehicle fuel storage tanks for the purpose of maintenance, cylinder certification, calibration of dispensers or other activities shall be in accordance with Section 2210.8.1

2210.8.1 Methods of discharge. The discharge of hydrogen from motor vehicle fuel storage tanks shall be accomplished through a closed transfer system in accordance with Section 2210.8.1.1 or an approved method of atmospheric venting in accordance with Section 2210.8.1.2

2210.8.1.1 Closed transfer system. A documented procedure describing the logical sequence for discharging the storage tank shall be provided to the code official for review and approval. The procedure shall include the actions the operator will take in the event of a low-pressure or high-pressure hydrogen release during discharging activity. Construction documents shall be provided illustrating the arrangement of piping, regulators and equipment settings. The construction documents shall illustrate the piping and regulator arrangement and shall be shown in spatial relation to the location of the compressor, storage vessels and emergency shutdown devices.

2210.8.1.2 Atmospheric venting of hydrogen from motor vehicle fuel storage containers. The discharge of hydrogen from motor vehicle fuel storage tanks for the purposes of maintenance, cylinder certification, calibration of dispensers or other activities shall be in accordance with Sections 2210.8.1.2.1 through 2210.8.1.2.4.

2210.8.1.2.1 Defueling equipment required at vehicle maintenance and repair facilities. All facilities for repairing hydrogen systems on hydrogen vehicles will have a facility to defuel the vehicle storage tank(s). Vehicle storage tanks for defueling to a vent pipe shall be connected to the vent pipe by a valve of the type supplied by the vehicle manufacturer. The rate of flow shall not exceed 1,000 scfm (2.5 kg/min) and shall be controlled via the supplied equipment, at low pressure and without adjustment. The vent pipe for defueling shall not be used for or flow into a vent pipe for any other purpose. The defueling vent pipe shall have a diameter of 1 inch and terminate in accordance with Section 2209.7.1; with a minimum height (H) of at least 8 ft. and a minimum distance (D) to exposures of 15 ft. The minimum design pressure of the vent piping shall be 335 psig.

2210.8.1.2.2 Construction documents. Construction documents shall be provided illustrating the location of the means for vessel support, piping, the method of grounding and bonding, and other requirements specified herein.

2210.8.1.2.3 Tank and cylinder stability. A method of rigidly supporting the vessel during the discharge or defueling of hydrogen shall be provided. The selected method shall provide not less than two points of support and shall prevent the horizontal and lateral movement of the vessel. The system shall be designed to prevent the movement of the vessel based on the highest gas-release velocity through valve orifices at the vessel's rated pressure and volume. The structure or appurtenance shall be constructed of noncombustible materials as set forth in the International Building Code®.

2210.8.1.2.4 Grounding and bonding. The structure or appurtenance used for supporting the vessel shall be grounded in accordance with the ICC Electrical Code. The valve of the vehicle storage tank shall be bonded prior to the commencement of discharge or defueling operations.

2210.8.2 Repair of hydrogen piping. Piping systems containing hydrogen shall not be opened to the atmosphere for repair without first purging the piping with an inert gas to achieve one percent hydrogen or less by volume. Defueling operations and exiting purge flow shall be vented in accordance with Section 2210.8.1.2.

2210.8.3 Purging. Each individual manufactured component of a hydrogen generating, compression, storage, or dispensing system shall have a label affixed as well as a description in the installation and owners manuals describing the procedure for purging air from the system during start-up, regular maintenance and for purging hydrogen from the system prior to disassembly to admit air.

For the interconnecting piping between the individual manufactured components the pressure rating must be at least 20 times the absolute pressure present in the piping when any hydrogen meets any air. [Example: hydrogen meets air in an interconnecting pipe at 3 psig. 3 psig is 17.5 psia. The minimum pressure rating of the pipe would have to be 20 x 17.5 = 350 psia or 335 psig.]

2210.8.3.1 System purge required. After installation, repair or maintenance, the hydrogen piping system shall be purged of air in accordance with the manufacturer’s procedure for purging air from the system.

Committee Reason: The code change is needed to address new technology that is already being used.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Larry Fuer and Kevin Scott, Fuer, Inc. and Kern County California Fire Department, respectively, representing Compressed Gas Association and Kern County Fire Department, respectively, request Approved as Modified by this Public Comment.

Modify proposal as follows:

SECTION 2210
REPAIR GARAGES

2210.8 Defueling of hydrogen from motor vehicle fuel storage containers. The discharge or defueling of hydrogen from motor vehicle fuel storage tanks for the purpose of maintenance, cylinder certification, calibration of dispensers or other activities shall be in accordance with Section 2210.8.1

2210.8.1 Methods of discharge. The discharge of hydrogen from motor vehicle fuel storage tanks shall be accomplished through a closed transfer system in accordance with Section 2210.8.1.1 or an approved method of atmospheric venting in accordance with Section 2210.8.1.2

2210.8.1.1 Closed transfer system. A documented procedures describing the logical sequence for discharging the storage tank...
shall include the actions the operator will be required to take in the event of a low pressure or high pressure hydrogen release during discharging activity. Construction Schematic design documents shall be provided illustrating the arrangement of piping, regulators and equipment settings. The construction documents shall illustrate the piping and regulator arrangement and shall be shown in spatial relation to the location of the compressor, storage vessels and emergency shutdown devices.

2210.8.1.2 Atmospheric venting of hydrogen from motor vehicle fuel storage containers. When atmospheric venting is used for the discharge of hydrogen from motor vehicle fuel storage tanks for the purposes of maintenance, cylinder certification, calibration of dispensers or other activities such venting shall be in accordance with Sections 2210.8.1.2.1 through 2210.8.1.2.4.

2210.8.1.2.1 Defueling equipment required at vehicle maintenance and repair facilities. All facilities for repairing hydrogen systems on hydrogen fueled vehicles will have a facility shall have equipment to defuel the vehicle storage tank(s). Equipment used for defueling shall be listed and labeled for the intended use.

2210.8.1.2.1.1 Manufacturer’s equipment required. Equipment supplied by the vehicle manufacturer shall be used to connect the vehicle storage tanks for defueling to the vent pipe by equipment supplied by the vehicle manufacturer system.

2210.8.1.2.1.2 Vent pipe maximum diameter. Defueling vent pipes shall have a maximum inside diameter of 1 inch (25.4 mm) and be installed in accordance with Section 2209.7.

2210.8.1.2.1.3 Maximum flow rate. The maximum rate of hydrogen flow through the vent pipe system shall not exceed 1,000 scfm (2.5 kg/min) and shall be controlled via by means of the supplied manufacturer’s equipment, at low pressure and without adjustment.

2210.8.1.2.1.4 Isolated use. The vent pipe used for defueling shall not be used for or flow into connected to another venting system pipe used for any other purpose. The defueling vent pipe shall have a diameter of 1 inch and terminate in accordance with Section 2209.7.1, with a minimum height (H) of at least 0 ft, and a minimum distance (D) to exposures of 15 ft. The minimum design pressure of the vent piping shall be 325 psi.

2210.8.1.2.2 Construction documents. Construction documents shall be provided illustrating the defueling system to be utilized. Plan details shall be of sufficient detail and clarity to allow for evaluation of the location of the means for vessel support, piping and control systems to be utilized including the method of support for cylinders, containers or tanks to be used as part of a closed transfer system, the method of grounding and bonding, and other requirements specified herein.

2210.8.1.2.3 Tanks and Stability of cylinders, containers and tanks stability. A method of rigidly supporting the vessel(s), cylinders, containers or tanks used during the closed transfer system discharge or defueling of hydrogen shall be provided. The selected method shall provide not less than two points of support and shall be designed to resist the horizontal and lateral movement of the receiving cylinder, container or tank vessel. The system shall be designed to prevent the movement of the vessel(s) based on the highest gas release velocity through valve orifices at the vessels receiver’s rated service pressure and volume.

The supporting structures or appurtenances used to support receivers shall be constructed of noncombustible materials as set forth in accordance with the International Building Code®.

2210.8.1.2.4 Grounding and bonding. Cylinders, containers or tanks and piping systems used for defueling shall be bonded and grounded. The structures or appurtenance used for supporting the vessel(s), cylinders, containers or tanks shall be grounded in accordance with the ICC Electrical Code. The valve of the vehicle storage tank shall be bonded with the defueling system prior to the commencement of discharge or defueling operations.

2210.8.2 Repair of hydrogen piping. Piping systems containing hydrogen shall not be opened to the atmosphere for repair without first purging the piping with an inert gas to achieve one percent hydrogen or less by volume. Defueling operations and exiting purge flow shall be vented in accordance with Section 2210.8.1.2.

2210.8.3 Purging. Each individual manufactured component of a hydrogen generating, compression, storage, or dispensing system shall have a label affixed as well as a description in the installation and owners manuals describing the procedure for purging air from the system during start-up, regular maintenance and for purging hydrogen from the system prior to disassembly.

For the interconnecting piping between the individual manufactured components the pressure rating must be at least 20 times the absolute pressure present in the piping when any hydrogen meets any air.

2210.8.3.1 System purge required. After installation, repair or maintenance, the hydrogen piping system shall be purged of air in accordance with the manufacturer’s procedure for purging air from the system.

Commenter’s Reasons: 2210.8.1.1 Clarification in part and to require the design documents to be schematic in nature. Schematic plans are simplified plans that clearly illustrate the arrangement of piping, valving and controls.

2210.8.1.2 The existing language is redundant to Section 2210.8. Section 2210.8.1.2 provides requirements for atmospheric venting systems. The charging language should be focused on the intent of the requirements. The installation of the venting system is to be installed in accordance with the requirements of Section 2209.7. Requirements for installation and termination should be consistent with those used for venting systems employed for fueling systems.

2210.8.1.2.1 Revised to require facilities to have defueling equipment rather than to predict which equipment will be there. Modifications to require listed and labeled equipment are in harmony with Section 2209.2.2.

2210.8.1.2.1.1 through 2210.8.1.2.1.4 revised primarily for reformatting and clarification of requirements to clarify intent.

2210.8.1.2.2 Clarification.

2210.8.1.2.3 Clarification as to what containers are to be secured to resist movement. In general systems cannot be designed to “prevent” movement. They can, however, resist movement. Horizontal and lateral movement are equivalent. Deleting the term horizontal from the section eliminates the redundancy.

2210.8.1.2.4 To clarify those elements that are required to be bonded, and those elements that are required to be grounded.
Proposed Change as Submitted:

Proponent: Elly Klausbruckner, Klausbruckner & Associates

Revise as follows:

2306.9 Aisles. Aisles providing access to exits and fire department access doors shall be provided in high-piled storage areas exceeding 500 square feet (46 m²), in accordance with Section 2306.9.1 through Section 2306.9.3. Aisles separating storage piles or racks shall also comply with NFPA 231, NFPA 231C and Aisles shall also comply with Chapter 10.

Exception: Where aisles are precluded by rack storage systems, alternate methods of access and protection are allowed when approved.

2306.9.1 Width. Aisle width shall be in accordance with Figure 2306.9.1.1 and Figure 2306.9.1.2.

EXCEPTIONS:

1. Cross aisles used only for employee access between aisles shall be a minimum of 24 inches (610 mm) wide.
2. Aisles separating shelves classified as shelf storage shall be a minimum of 30 inches (762 mm) wide.

2306.9.1.1 Sprinklered buildings. Aisles in sprinklered buildings shall be a minimum of 44 inches (1118 mm) wide. Aisles shall be a minimum of 96 inches (2438 mm) wide in high piled storage areas exceeding 2,500 square feet (232 m²) in area, that are public accessible and designated to contain high hazard commodities.

Exception: Aisles in high pile storage areas exceeding 2500 (232 m²) square feet in area, that are public accessible and designated to contain high hazard commodity that are protected by a sprinkler system designed to protect multiple-row racks of high hazard commodity shall be a minimum of 44 inches (1118 mm) wide.

Aisles shall be a minimum of 96 inches (2438 mm) wide in public accessible areas where mechanical stocking methods are used.

2306.9.1.2 Nonsprinklered buildings. Aisles in nonsprinklered buildings shall be a minimum of 96 inches (2438 mm) wide.

2306.9.2 Clear height. The required aisle width shall extend from floor to ceiling. Rack structural supports and catwalks are allowed to cross aisles at a minimum height of 6 feet 8 inches (2032 mm) above the finished floor level, provided that such supports to not interfere with fire department hose stream trajectory.

2306.9.3 Dead ends. Dead-end aisles shall be in accordance with Chapter 10.

Proponent’s Reason: There is a lot of confusion when it comes to the differences between aisles, cross-aisles and aisles providing access to exits and fire department access doors. All aisles, whether they are cross-aisles or whether they separate storage piles or racks, provide access to exits and fire department access doors. This section has been revised to include all aisles. Cross-aisle exception has been removed, since cross-aisles are not defined.

Since NFPA 231 and 231C have been replace by NFPA 13, NFPA 13 has been referenced in lieu of 231 and 231C. Also, all aisles must comply with Chapter 10, not just aisles separating storage piles or racks.

The most important difference in this code change proposal is the 96” aisle width requirements. The original intent of this code requirement (UFC Article 81) was for buildings that are public accessible, such as mercantile, where aisle displays (small displays between aisles) are common. Aisle displays reduce the exiting width by several feet, and they may contribute to aisle jumps (radiative heat from the burning rack/pile causing the rack/pile across the aisle to ignite) in fire situations. Aisle displays are not common in other occupancies, such as storage occupancies. Additionally, aisle maintenance sections of the code regulate aisle widths during re-stocking in storage occupancies.

Another proposed change to section 2306.9.1 allows for smaller aisle widths for high hazard commodity exceeding 2500 square feet if protected (sprinkler protection) as multiple-row rack array. Higher level of sprinkler system protection, such as an ESFR system (or additional levels on in-rack sprinklers), has never been considered as an alternative option to the 96” aisle widths. If the sprinkler protection can protect multiple-row racks of high hazard commodity, it will protect small aisle displays between aisles.

Committee Action: Approved as Submitted

Committee Reason: The code change clarifies issues dealing with aisles in high-piled storage areas.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, International Code Consultants, representing UNIVA U.S.A., Inc., requests Approved as Modified by this Public Comment.

Modify proposal as follows:

2306.9.1 Width. Aisle width shall be in accordance with
EXCEPTIONS:

1. Cross aisles used only for employee access between aisles shall be a minimum of 24 inches (610 mm) wide.
2. Aisles separating shelves classified as shelf storage shall be a minimum of 30 inches (762 mm) wide.

Commenter’s Reason: This exception was deleted without a valid substantiation. The proponent recommended deleting the exception because the code does not define “cross aisle,” which was thought to cause difficulties in interpretation. The proponent also implied that the exception was not believed to be widely utilized by industry.

In fact, application of the exception is understood by industry, and use of the provision, which first appeared in a model code in 1982, is common in large warehouse facilities where rack structures are arranged perpendicular to an exterior wall. In such cases, aisles created between racks often exceed the maximum dead-end length of 20-feet for Group S or Group H (See Sec. 1004.3.2.3), requiring a secondary means of egress at the end of the aisle. The secondary means of egress is often accomplished through the use of cross aisles that permit movement across the rack structure from one aisle to another.

The existing allowance for a 24-inch wide aisle to accomplish movement across racks is more than adequate from a safety perspective, given the limited number of occupants in high-plied storage facilities and the infrequency of use. Requiring an increase in width to 44-inches would result in a substantial loss of usable storage volume (20-inches times the height and width of all rack structures positioned perpendicular to an exterior wall).

Simply deleting the term “cross aisle” from Chapter 23 based on the lack of a definition is unwarranted, and such an action would not fully address the issue anyway because the term will still appear several times in both IFC Chapter 10 and IBC Chapter 10.

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3204.3.1.1, 3404.2.9.5.1, 3406.2.4.4

Proposed Change as Submitted:

Proponent: Michael G. Kraft, Ohio Division of State Fire Marshal

Revise as follows:

3204.3.1.1 Location. Stationary containers shall be located in accordance with Section 3203.6. Containers of cryogenic fluids shall not be located within diked areas containing other hazardous materials.

Storage of flammable cryogenic fluids in stationary containers outside of buildings is prohibited within the limits established by law as the limits of districts in which such storage is prohibited where such districts are established by the local ordinances and regulations of the governing body.

Revise as follows:

3406.2.9.5.1 Locations where above-ground tanks are prohibited. Storage of Class I and II liquids in above-ground tanks outside of buildings is prohibited within the limits established by law as the limits of districts in which such storage is prohibited where such districts are established by the local ordinances and regulations of the governing body.

Revise as follows:

3406.2.4.4 Locations where above-ground tanks are prohibited. The storage of Class I and II liquids in above-ground tanks is prohibited within the limits established by law as the limits of districts in which such storage is prohibited where such districts are established by the local ordinances and regulations of the governing body.

Proponent’s Reason: Editorial in nature and intended to provide clarification of the requirements without changing the intent.

Committee Action: Approved as Modified

Modify proposal as follows:

3204.3.1.1 Location. Stationary containers shall be located in accordance with Section 3203.6. Containers of cryogenic fluids shall not be located within diked areas containing other hazardous materials.

Storage of flammable cryogenic fluids in stationary containers outside of buildings is prohibited within the limits established by law as the limits of districts in which such storage is prohibited where such districts are established by the local ordinances and regulations of the governing body.

3406.2.9.5.1 Locations where above-ground tanks are prohibited. Storage of Class I and II liquids in above-ground tanks outside of buildings is prohibited within the limits established by law as the limits of districts in which such storage is prohibited where such districts are established by the local ordinances and regulations of the governing body.

3406.2.4.4 Locations where above-ground tanks are prohibited. The storage of Class I and II liquids in above-ground tanks is prohibited within the limits established by law as the limits of districts in which such storage is prohibited where such districts are established by the local ordinances and regulations of the governing body.

3804.2 Maximum capacity within established limits. Within the limits established by law in the adopting ordinance restricting the storage of liquefied petroleum gas for the protection of heavily populated or congested areas, the aggregate capacity of any one installation shall not exceed a water capacity of 2,000 gallons (7570 L). (See sample adoption ordinance, Section 3).

Exception: In particular installations, this capacity limit shall be determined by the code official, after consideration of special features such as topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed containers, degree of fire protection to be provided, and capabilities of the local fire department.

Committee Reason: The code change provides consistency in the code and clarifies locations where tanks are prohibited.
Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kermit C. Robins, City of Portland, Oregon, representing Oregon Building Officials Association, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

3204.3.1.1 Location. Stationary containers shall be located in accordance with Section 3203.6. Containers of cryogenic fluids shall not be located within diked areas containing other hazardous materials.

For established districts, storage of flammable cryogenic fluids in stationary containers outside of buildings is prohibited within the limits established by law as the limits of districts in which such storage is prohibited. (See sample adoption ordinance, Section 3)

3404.2.9.5.1 Locations where above-ground tanks are prohibited. For established districts, storage of Class I and II liquids in above-ground tanks outside of buildings is prohibited outside of buildings. Local jurisdictions shall establish districts by law, is prohibited within the limits established by law as the limits of districts in which such storage is prohibited. (See sample ordinance, Section 3)

3404.2.9.4 Locations where above-ground tanks are prohibited. For established districts, the storage of Class I and II liquids is prohibited in above-ground tanks. Local jurisdictions shall establish districts by law, is prohibited within the limits established by law as the limits of districts in which such storage is prohibited. (See sample ordinance, Section 3)

3804.2 Maximum capacity within established limits. For established districts, within the limits established by law restricting the storage of liquefied petroleum gas for the protection of heavily populated or congested areas, the aggregate capacity of any one installation of liquefied petroleum gas shall not exceed a water capacity of 2,000 gallons (7570 L). Local jurisdictions shall establish districts by law. Districts shall be established for heavily populated or congested areas. (See sample adoption ordinance, Section 3)

Exception: In particular installations, this capacity limit shall be determined by the code official, after consideration of special features such as topographical conditions, nature of occupancy, and proximity to buildings, capacity of proposed containers, degree of fire protection to be provided, and capabilities of the local fire department.

Commenter’s Reason: As proposed, the amended code sections are confusing at best. The proposal uses the term “limit” in three different ways: to limit the area the regulation applies to, to limit the quantity of substance and to limit the law. It is unclear whether the limits are to be established by law, the districts are to be established by law or both are required to be established by law. The re-write clarifies where the prohibitions or restrictions apply and when such restriction is required to be established by the local jurisdiction be law.

Proposed Change as Submitted:

Proponent: Paul Blackwell, Springfield Fire Department, MO.

Revise as follows:

3301.3 Fireworks. The possession, manufacture, storage, sale, handling and use of fireworks are prohibited.

Exceptions:
1 - 3 (No Change)
4. The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable local or state laws, ordinances and regulations provided such fireworks comply with CPSC 16 CFR, Parts 1500-1507, and DOTn 49 CFR, Parts 100-178, for consumer fireworks.

Proponent’s Reason: The wording appears to me that if the local jurisdiction prohibits but there are no state laws prohibiting, the word “or” would allow the possession, storage, sale, handling and use.

Committee Action: Approved as Submitted

Committee Reason: The code change clarifies the intent of the code and it is correct to change the terminology from or to and.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter’s Reason: The American Pyrotechnics Association (APA) is requesting that this code change which is recommended for Approval be overturned and Disapproved by the ICC voting membership. The proponent stated his reason for making the apparently simple, yet not so simple, revision to Exception 4 was due to his concern with the use of the word “or” in the present exception. He felt that the present exception would still allow the possession, storage, sale, and use of specific types of consumer fireworks even if the local jurisdiction passed an ordinance prohibiting consumer fireworks, but the state had no such law. By changing the word “or” to “and”, it was his theory that it would only be necessary for the local jurisdiction to pass an ordinance prohibiting consumer fireworks even if the state did not.

This issue is confusing because of the fact that this is an exception to a prohibition, so we are dealing with double negatives, in effect. Our interpretation of the effect of this code change as approved by the International Fire Code Committee is that consumer fireworks would be prohibited unless both the state and local laws and/or ordinances specifically allowed them. So if a local jurisdiction allows them but the state law is silent, it could be interpreted that the enforcement of the International Fire Code would prohibit consumer fireworks in the local jurisdiction. A case in point where this has real impact is the State of

F209-02
3301.1.3

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Nevada where there is no State law for consumer fireworks. However, many local jurisdictions (both cities and counties) have passed regulations allowing consumer fireworks under specific conditions. Therefore, under the present International Fire Code requirements, the possession, storage, sale and use of consumer fireworks would not be prohibited by the International Fire Code. However, if this code change is approved, since there is no State law in Nevada specifically allowing consumer fireworks, then the International Fire Code adopted in a local jurisdiction in that state would prohibit the possession, storage, handling and use of consumer fireworks in that jurisdiction because of the way Exception 4 would be interpreted and enforced.

This potentially sets up a conflict within a local jurisdiction that adopts the International Fire Code and adopts regulations allowing consumer fireworks in a State where there is no applicable State law.

It should also be kept in mind that no local jurisdiction can allow something that is prohibited by State law. In other words, a local jurisdiction cannot be more permissive than State law. So the opposite is not an issue. A local jurisdiction could not pass a law allowing consumer fireworks in a State where State law basically prohibits them, even if the jurisdiction adopted the International Fire Code as it presently reads. Another issue arises as to the case where the State law allows consumer fireworks but there are no applicable local laws or ordinances that allow consumer fireworks in the State where State law preempts local regulation. In that case, if this code change is approved, a local jurisdiction could, in effect, adopt the International Fire Code and claim that consumer fireworks are prohibited because there is no applicable local law, ordinance, or regulation specifically allowing consumer fireworks. However, if this code change is disapproved, that situation would not be an issue and there would be no conflict between the State and the local jurisdiction.

Based on these reasons, we respectfully request that the ICC voting membership overturn the Committee recommendation for Approved as Submitted and Disapprove this code change to maintain the status quo in the International Fire Code on this issue.

**F218-02**

**3404.3.8.5**

**Proposed Change as Submitted:**

**Proponent:** Michael J. Laderoute, JL Associates, Inc.; representing Fire Equipment Manufacturers Association, Inc.

**Committee Action:** Approved as Submitted

**Committee Reason:** The code change provides a specific code section to go to.

**Assembly Action:** No Motion

**Individual Consideration Agenda:**

**This item is on the agenda for individual consideration because a public comment was submitted.**

**Public Comment:**

**Jeffrey Shapiro, International Code Consultants,**

**representing UNIVAR U.S.A., Inc., requests Approved as Modified by this Public Comment.**

**Modify proposal as follows:**

**3404.3.8.5 Warehouse hose lines.** In liquid storage warehouses, either 1.5-inch (38 mm) lined or 1-inch (25 mm) hard rubber hand hose lines shall be provided in sufficient number to reach all liquid storage areas and shall be in accordance with Section 903 or Section 905.

**Commenter’s Reason:** Although this proposal appears to be pretty straightforward on the surface, it actually constitutes a significant change in the code with respect to common practice. Presently, Section 3404.3.8.5 points to Chapter 9 as the basis for installation of warehouse hose lines. The proposal redirects reference to Section 905, which is the section governing standpipe systems and which requires compliance with NFPA 14.

The effect of this proposal would be to require all hose connections in liquid storage warehouses to connect to a dedicated standpipe system with piping that is largely independent of the sprinkler system. In actuality, warehouse hose lines are often supplied by overhead sprinkler piping, as opposed to a dedicated standpipe system.

When sprinkler system piping is used to supply warehouse hose lines, the system is required to be suitably designed to handle the additional hydraulic demand of hose lines, and special provisions in Section 5-15.5 of NFPA 13 are applicable. There is no apparent reason for the code to now prohibit this practice by mandating compliance with NFPA 14. Consequently, this comment recommends revising the reference to include Section 903, which ties to NFPA 13 and provides the user with proper design criteria for installing hose connections in a standpipe system. The option of using NFPA 14 remains, but is not mandated as the only solution.

**F219-02**

**3405.2.4**

**Proposed Change as Submitted:**

**Proponent:** Patrick McLaughlin, McLaughlin and Associates; representing the Sherwin Williams Company

**Revise as follows:**

**3405.2.4 Class I, II and III liquids.** Class I and II liquids or Class II or Class III liquids that are heated up to or above their flash points shall be transferred by one of the following methods:

(No change to Items 1-5)

**Commenter’s Reason:** The proposal coordinate the IFC® with NFPA 30, Section 5-5.2. Also, as written, Class II liquids in their original containers cannot be poured from containers greater than 5.3 gallons when this limitation was intended to apply only to Class I liquids.
Committee Action: Disapproved

Committee Reason: The code change is disapproved at the Proponents request.

Assembly Action: No Motion

**Individual Consideration Agenda:**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Kevin H. Scott, Kern County Fire Department, requests Approved as Modified by this Public Comment.

Modify current text as follows:

3405.2.4 Class I, and II and III liquids. Class I and II liquids or Class III liquids when heated up to or above their flash points shall be transferred by one of the following methods:

(Items 1 thru 5 to remain unchanged.)

**Commenter’s Reason:** The section contains requirements for the safe transfer of flammable/combustible liquids. The section currently does not address Class III liquids when then are transferred at temperatures above their flashpoint. Class III liquids when heated to their flash point are as readily ignitable as Class I liquids. The inclusion of this section will correlate with the current requirements of IFC Section 3401.5 and NFPA 30 Section 5-5.2.

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**F223-02**

3606.5.7

**Proposed Change as Submitted:**

**Proponent:** Michael J. Laderoute, MJL Associates, Inc.; representing Fire Equipment Manufacturers Association, Inc.

**Revise as follows:**

3606.5.7 Fire-extinguishing materials. A supply of approved extinguishing materials available within 30 feet in an approved container with a hand scoop or shovel for applying material on magnesium fires available within 30 feet, or an approved portable fire extinguisher complying with Section 906 and designed for use with such material available within 75 feet, shall be readily accessible to every operator performing machining, grinding or other processing operation on magnesium.

**Proponent’s Reason:** This change is being offered in order to make the code more user friendly. Additionally, the 75 foot requirement is consistent with Section 906, Table 906.3(1). The 30 foot requirement is being added when an approved container with a hand scoop or shovel is being utilized, as this method is not as efficient as when using an approved portable fire extinguisher. The travel distance and reaction time is critical to successful extinguishment when dealing with this type of hazard.

Committee Action: Approved as Submitted

Committee Reason: The code change provides consistency with provisions in Section 906.

Assembly Action: No Motion

**Individual Consideration Agenda:**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Bonnie L. Howe, City of Goodyear, Arizona, representing Goodyear Fire Department, requests Approved as Modified by this Public Comment.

Modify proposal as follows:

3606.5.7 Fire-extinguishing materials. A supply of approved extinguishing materials available within 30 feet in an approved container with a hand scoop or shovel for applying material on magnesium fires available within 30 feet, or an approved portable fire extinguisher complying with Section 906 and designed for use with such material available within 75 feet, shall be readily accessible to every operator performing machining, grinding or other processing operation on magnesium.

**Commenter’s Reason:** This moves the phrase ‘available within 30 feet’ in order to clarify the section. The location of the fire extinguishing material is to be within 30 feet. The modifying phrase is out of place in reference to the intent of the code section. A committee member suggested this modification at the time in Pittsburgh, but the committee vote had already determined the ‘as submitted’ outcome.

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**F225**

3704.2.2.7

**Proponent:** Jeffrey M. Shapiro, International Code Consultants; representing The Chlorine Institute

**Revise as follows:**

3704.2.2.7 Treatment systems. The exhaust ventilation from gas, cabinets, exhausted enclosures and gas rooms, and local exhaust systems required in Sections 3704.2.2.4 and 3704.2.2.5 shall be directed to a treatment system. The treatment system shall be utilized to handle the accidental release of gas and to process exhaust ventilation. The treatment system shall be designed in accordance with Sections 3704.2.2.7.1 through 3704.2.2.7.5 and Section 510 of the International Mechanical Code®.

**Exceptions:**

1. (No change)
2. Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks when the following are provided:
   2.1. A gas detection system with a sensing interval not exceeding 5 minutes.
   2.2. An approved automatic-closing fail-safe valve located immediately adjacent to cylinder valves. The fail-safe valve shall close when gas is detected at the permissible exposure limit (PEL) by a gas detection system monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room. The gas detection shall comply with Section 3704.2.2.10.

Proponent’s Reason: The provisions in Exception 2 emphasize stopping a leak, as opposed to requiring treatment of complete releases. Thereby, Exception 2 actually provides a higher level of safety than the base requirement of Section 3704.2.2.7.

Section 3704.2.2.7 requires a treatment system, based on an assumption that the contents of a vessel containing a toxic or highly toxic gas could be entirely released, and requires that the treatment system be capable of limiting the toxicity of the release at the point of discharge to atmosphere. There is no requirement to limit toxicity to safe levels inside of buildings or gas rooms where cylinders are kept. Consequently, gas concentrations in such areas could be significant in the event of a release.

In contrast, Exception 2 prescribes a design basis requiring detection of a leak at relatively low concentration levels to shut-off of the flow of gas at the source. This is a much more effective means of mitigating the hazard of an unintended release.

The problem addressed by this code change relates to limitations associated with the use of the term “cylinder” in Exception 2. Because of size limitations associated with the definition of “cylinder” in the IFC®, many portable vessels containing compressed gases do not currently fit this definition. Consequently, such vessels would be technically excluded from Exception 2 as the code is currently written, even though allowing the use of Exception 2 would actually improve the overall level of safety. The proposed revision extends application of Exception 2 to include “portable tanks” containing compressed gases so that Exception 2 can encompass all portable vessels compressed gases.

Committee Action: Approved as Submitted

Committee Reason: The code change provides for safety of portable tanks as well as cylinders when complying with the requirements in the Exception.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Jeffrey M. Shapiro, International Code Consultants, requests Approved as Modified by this comment.

Modify proposal as follows:

3704.2.2.7 Treatment systems. The exhaust ventilation from gas, cabinets, exhausted enclosures and gas rooms, and local exhaust systems required in Sections 3704.2.2.4 and 3704.2.2.5 shall be directed to a treatment system. The treatment system shall be utilized to handle the accidental release of gas and to process exhaust ventilation. The treatment system shall be designed in accordance with Sections 3702.2.7.1 through 3702.2.7.5 and Section 510 of the International Mechanical Code®.

Exceptions:

1. (No change)
2. Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks not exceeding 660 gallons liquid capacity when the following are provided:
   2.1. A gas detection system with a sensing interval not exceeding 5 minutes.
   2.2. An approved automatic-closing fail-safe valve located immediately adjacent to cylinder valves. The fail-safe valve shall close when gas is detected at the permissible exposure limit (PEL) by a gas detection system monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room. The gas detection shall comply with Section 3704.2.2.10.

Commenter’s Reason: At the Pittsburgh hearing, questions were raised regarding the maximum vessel size for potable tanks. Although I had believed that the IFC specified a 660-gallon limit on these vessels, the UFC had done, no such limit was found when I later reviewed the IFC. Consequently, the 660-gallon limit, which is derived from portable tank limits set forth in the UFC for flammable and combustible liquids, is proposed here so that the code change is limited in the manner that was anticipated by the code development committee and the members that were present in Pittsburgh.

Public Comment 2:


Commenter’s Reason: This code change should be disapproved, because the reason for the change given by the proponent is wrong and incomplete. It is wrong because eliminating the requirement for a treatment system does not improve the safety of a toxic gas installation. Exception 2 allows elimination of treatment if a gas detector and automatic shutoff valve are provided. Gas detection and automatic shutoff are already required by Section 3704.2.2.10.2. As a result, the gas detection and shutoff described in Exception 2 are redundant and do not provide additional safety as stated by the proponent. With respect to incomplete information, the proponent infers that the automatic shutoff valve will stop all leaks. This is not correct. For example, the Chlorine Institute identifies 9 locations on ton containers where leaks may occur, including valves and fusible plugs (1). An automatic shutoff valve on the supply piping does not protect these potential leak locations. The code official should have the authority to require treatment in locations where it is needed to protect the public. If it is not needed, the code official can accept a request for alternate methods. (1) Chlorine Institute Emergency Kit B for Chlorine Ton Containers, 1981.)
Proposed Change as Submitted:

Proponent: Patrick McLaughlin, McLaughlin & Associates; representing the Semiconductor Industry Association

Revise as follows:

[F]414.6 Outside Outdoor storage, dispensing and use.

The outdoor storage, dispensing and use of hazardous materials shall be in accordance with the International Fire Code®.

414.6.1 Weather protection. Where weather protection is provided for sheltering outdoor hazardous material storage or use areas, such storage or use shall be considered outdoor storage or use, provided that all of the following conditions are met:

1. Structure supports and walls shall not obstruct more than one side nor more than 25 percent of the perimeter of the storage or use area. The outdoor storage or use area shall have not more than one exterior wall that obstructs more than one side, with all other sides unobstructed by walls and open to the surrounding environment.

2. The distance from the structure and the structure supports to buildings, lot lines, public ways or means of egress to a public way shall not be less than the distance required for an outside hazardous material storage or use area without weather protection.

3. The overhead structure shall be of approved noncombustible construction with a maximum area of 1,500 square feet (140 m²).

EXCEPTION: The increases permitted by Section 506 apply.

Committee Reason: The code clarifies the requirements for the amount of walls permitted with weather protection.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, International Code Consultants, representing The Chlorine Institute, requests Approved as Modified by this Public Comment.

414.6.1 Weather protection. Where weather protection is provided for sheltering outdoor hazardous material storage or use areas, such storage or use shall be considered outdoor storage or use, provided that all of the following conditions are met:

1. Structure supports and walls shall not obstruct more than one side of the storage or use area, except that partial obstruction of multiple sides shall be permitted where the obstructed perimeter on multiple sides does not exceed or more than 25 percent of the total perimeter area of the storage or use area.

2. And 3. remain unchanged

Commenter’s Reason: Editorial clarification to ensure that the intent is clear. The current text could be read to require that both limits apply, which was not the intent of the committee action.

Committee Action: Approved as Modified

Modify proposal as follows:

[F]414.6 Outdoor storage, dispensing and use. The outdoor storage, dispensing and use of hazardous materials shall be in accordance with the International Fire Code®.

414.6.1 Weather protection. Where weather protection is provided for sheltering outdoor hazardous material storage or use areas, such
Proposed Change as Submitted:

Proponent: Gregory G. Victor, Glendale Fire Department

1. Add a new item 8 as follows:

8. To provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

2. Revise as follows:

101.2.2 Fire. Part III of this code establishes requirements necessary to provide an acceptable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in all facilities, equipment and processes and provisions to assist emergency response personnel.

Proponent’s Reason: This proposal clarifies that code officials are concerned about the safety of fire fighters and other emergency responders and that many provisions of this code are intended to apply to fire fighter safety during emergency operations.

Committee Action: Disapproved

Committee Reason: The International Performance Code is unique when compared to the remaining family of prescriptive based I-codes. The format of the code includes general statements such as those found in Section 101.2, followed by the objective, performance statements and functional statements throughout the code. The proposed text is redundant with such provisions and as such is not necessary in the code. The concerns identified in the proposal are explicitly addressed in Chapters 20 and 21 which deal with emergency access and emergency responder safety, respectively.

Assembly Action: Approved as Submitted - Motion Failed

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Rob Geislinger, Parker Fire Protection District, representing the Fire Marshal’s Association of

Colorado requests Approval as Submitted.

Commenter’s Reason: Over the past years we have seen a significant decrease in property loss, injuries and fatalities as a result of fire.

Unfortunately, despite a decrease in the number of fires, firefighter deaths have remained relatively static, indicating that the number of firefighter deaths per fire is increasing. Why is this? While the codes and standards bodies have done an excellent job in improving public safety we have not adequately addressed the safety of our emergency responders who we expect to protect us from disaster.

Although the performance code is unique, as stated in the committee’s reason, it is still necessary to emphasize emergency responder safety at least on par with building safety.

Although firefighters and other emergency responders are generally aware of the hazards they face, it is incumbent upon us as builders, design professionals, industry and code officials to promulgate a code that recognizes these specific hazards, and limits them, where possible.

Public Comment 2:

Gregory Victor, Glendale Fire Department, representing the Arizona Fire Marshals Association requests Approval as Modified.

Modify proposal as follows:

8. To provide a reasonable level of safety to firefighters and emergency responders during emergency operations.

Commenter’s Reason: This proposal is a change to the INTENT section of the Code only and does not impose or require any additional requirements beyond the current parameters of the code. This proposal essentially codifies current practice. These additions are not requirements and do not in any way change or alter the body of the code or impose any additional requirements beyond the parameters of the current code. When code officials attempt to interpret, apply and modify provisions of any code it is in the best interests of all involved that there is a complete understanding of what the original intent and purpose of the document was. This proposal simply adds a reference in the intent section in two locations to keep our minds on the intent of the document when we are using it. The IBC General Committee approved this similar language for inclusion in the Building Code. Approving this proposal will bring the performance code into agreement as to the intent of these documents during the design, construction and maintenance of buildings and facilities.

The Committee’s reason for disapprove states in part that this language is redundant and not necessary in the code and that the concerns raised are handled in Chapters 20, Emergency Notification, Access and Facilities and Chapter 21, Emergency Responder Safety. Since the Performance Code already deals with these issues, why is there so much opposition to including intent language for these Chapters? If the Committee’s reason is correct then there is no need for the entire intent section since all of the concerns are handled in the specific Chapters. I urge your support for this proposal.
Public Comment 3:

Sam Francis, American Forest & Paper Association requests Approval as Modified.

Modify proposal as follows:

8. To provide a reasonable level of safety to fire fighters and emergency responders during emergency search and rescue operations.

Commenter’s Reason: The Performance Code does not bring with it the history and background of the more prescriptive traditional building codes. Its goals and objectives describe its expectations. In that sense, it is proper to state explicitly that it is an expectation of the jurisdiction adopting this code that the performance of the structure will include the protection of the first-responders for the time necessary to search for and assist occupants who are either unaware of the emergency situation or are unable to respond appropriately to it on their own.

PC2-02

101.2 (new)

Proposed Change as Submitted:

Proponent: ICC Code Correlation Committee

Add new text as follows:

101.2.1 Appendices. Provisions in the appendices of this code are provided as guidance only and are not intended to be adopted.

Proponent’s Reason. This is one of a series of proposed code changes that intend to clarify the application of appendices related to the ICC Performance Code and the other International Codes. Appendices are not applicable unless specifically referenced in the adopting ordinance. The ICC Codes Correlation Committee feels that, from a style standpoint, the ICC Performance Code should be no different. While the committee ultimately was of the opinion that this was a style issue and under the purview of the ICC Codes Correlation Committee, it was decided that due to the relationship of the appendices to the rest of the code, the membership should decide.

Committee Action: Disapproved

Committee Reason: This particular proposal was one of several proposals related to the way in which appendices were referenced within the body of the code. The other related proposals include PC4-02 through PC8-02 and PC14-02. The correlation committee put forth three options 1) have the appendices noted as being guidance only and keep the appendices, 2) Simply remove direct references from the body of the code but keep the appendices or 3) Delete the appendices and all references. The reason for the submittal was to address the differences in format of this code as compared with the other I-Codes.

This particular proposal would simply have noted within Chapter 1 that the appendices were for guidance only and were not intended to be adopted. Several of the appendices are necessary for the application of the code and should not be strictly advisory. Generally, the rest of the proposals were disapproved due to the fact that the appendices were felt to be critical to the application of the code.

Public Comment

Gary Lewis, City of Summit, NJ, requests Approval as Modified.

Delete and substitute proposal as follows:

1. Add new text as follows:

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

2. Revise as follows:

103.3.1.8 Special expert. Where the scope of work is limited or focused in an area that does not require the services of a design professional or the special knowledge and skills associated with the practice of architecture or engineering, a special expert may be employed by the owner as the person in responsible charge for the limited or focused activity. It is the intent of this code that the individual shall possess the appropriate qualifications in accordance with Section 103.3. characteristics required in Appendix D.

3. Revise as follows:

103.3.2 Design professional qualifications. The principal design professional, architects, engineers and other design professionals in responsible charge for their discipline as a member of a design team shall be responsible and accountable to possess the required knowledge and skills to perform design, analysis and verification in accordance with the provisions of this code and applicable professional standards of practice. It is the intent of this code that these individuals possess the qualification characteristics in accordance with Section 103.3.3 as stated in Appendix D. Qualification statements shall be submitted to the code official for the principal design professional, design professionals and special experts to demonstrate compliance in accordance with Section 103.3.3 Appendix D.

4. Add new text as follows:

103.3.3.9 Computer models. Computer modeling work is required to be conducted under the guidance of a qualified design professional. Knowledge and experience is required in the application of the performance-based design objectives for compliance with the objectives of this code.

5. Add new text as follows:

103.3.3 Qualification Characteristics.

103.3.3.1 Principal Design Professional Characteristics. Principal Design Professionals shall possess the following qualifications:

1. Registered architect or engineer by the state or
2. Knowledge of all facets of the project and the underlying principles of the performance-based code and concepts.

3. Ability to perform in the role of point of contact and to coordinate activities between the design team members, owner and code official.

4. Ability to ensure all elements of submittal to the code official are compatible, coordinated, logical, complete and comprehensive in documentation.

103.3.2 Design Professional Characteristics. Design Professionals shall possess the following qualifications:

1. Knowledge of underlying principles of performance-based code and concepts.

2. Education, training and experience in performance-based engineering design.

3. Skill in risk and hazard assessment tools as a design method.

4. Ability to utilize performance-based code objectives and to demonstrate compliance through documentation of decision-making and solutions.

5. High skill level in engineering disciplines needed in performance-based designs for structural, mechanical and fire protection systems.

103.3.3 Special Expert Characteristics. Special experts are those individuals who possess the following qualifications:

1. Individual who has credentials of education and experience in an area of practice which is needed to evaluate risks and safe operations associated with design, operations and special hazards.

2. Licensing or registration is required when required by a state or jurisdiction for the function to be performed.

103.3.4 Competent Reviewers Characteristics. The principal reviewer or code official is responsible to acquire competent reviewers with these characteristics and to utilize registered individuals when required by a state or jurisdiction. These characteristics are applicable to the code official’s staff and contract reviewers.


2. Education in performance-based engineering principles.

3. Competence in risk and hazard assessment tools as a design method.

4. Ability to verify design documents, meet analysis and documentation requirements, and to demonstrate that objectives are met.

5. High skill level in engineering disciplines needed in performance-based designs for structural, mechanical and fire protection systems.

(Revise remaining sections accordingly)

6. Revise as follows:

103.3.5.1 Required documentation. The documentation for the project shall identify the goals and objectives; the steps undertaken in the analytical analysis; the facility maintenance and testing requirements; and limitations and restrictions on the use of the facility in order to stay within the bounding conditions. When requirements for documentation are specified in applicable engineering and/or design guides, documentation shall be included in the design documents. Computer modeling shall be documented in accordance with Section 103.3.5.2. Computer Model Documentation. The following shall be part of the design documentation when computer models are used in the design of a building or facility.

1. Computer program data shall be submitted as part of documentation which shall include but not be limited to the program name, brief description, type of analysis and application, program input and output units and description, and how it is to be used to support the design. Statements of exact mathematical model(s) and accompanying submodel(s), if any, uncertainty, assumptions, limitations, scope of applicability, and a few reproducible simple benchmark cases shall be included.

2. Background data shall be submitted to substantiate why particular scenarios are rejected or accepted.

(Revise remaining sections accordingly)
The methodology for validation of this method for the project shall be acceptable to the principal design professional and the code official.

This method shall be substantiated by a system-based approach using at least two acceptable scenarios to demonstrate compliance with design objectives and code provisions.

Delete without substitution

Appendix C
Individually Substantiated Design Methods

Delete without substitution

Appendix D
Qualification Characteristics for Design and Review of Performance-Based Designs

Delete without substitution:

Appendix E
Use of Computer Models

Commenter's Reason: The rationale for the changes (PC2-02, PC4-02, PC5-02, PC6-02, PC7-02, PC8-02 and PC14-02) brought forth by the Correlating Committee had sufficient merit, but the changes as proposed could not be recommended for approval by the committee as it would have resulted in significant voids in the qualifications of code users and methods. This change seeks to embrace the concerns of the original proponent in moving technical provisions currently found in several of the appendices into new sections of the code itself, deleting them as appendices, and leaving but two of the original appendices along with standard ICC language about the relationship of appendices to the code. No new technical provisions are embodied within this comment, simply a methodology to correlate the ICC Performance Code with the preferred format of the ICC Family of Codes.

An explanation for each part follows:

1. The section was added to be consistent with the other I-Codes as to how appendices are addressed. This would require appendices to be specifically adopted.

2. The direct reference to Appendix D was deleted with a new reference to Section 103.3.3. Section 103.3.3 is a new section formed using the language found in Appendix D.

3. The same reason as Item 2 of this proposal.

4. This section was added to address qualification issues surrounding the use of computer models. This section was based upon language found in Section E102.1, Item 1 of Appendix E.

5. This section is from Appendix D. Essentially all of Appendix D, except for Section D101.1, was included.

6. This section was revised to remove the direct reference to Appendix E with a reference to a new Section 103.3.5, which specifically addresses computer model documentation.

7. This section is based upon Section E102.1, Items 2 and 3 (Note that Item 1 of Section E102.1 was used to create Section 103.3.3.9). See Item 4 of this reason.

8. This section was revised to remove the direct reference to Appendix D. Instead a reference is now made to new Section 103.3.3 which is based upon Appendix D.

9. This section was revised to replace the reference to Appendix C and provide the necessary criteria directly within the body of the code. The language found in this proposed revision includes all language from Appendix C except for Section C101.1, Scope.

10. This Appendix was deleted as the necessary language has been placed within the body of the code.

11. This Appendix was deleted as the necessary language has been placed within the body of the code.

12. This Appendix was deleted as the necessary language has been placed within the body of the code.

It should be noted that in several cases some language from the Appendices, primarily from the scope sections, was not included as it made the language awkward and repetitive. The following sections from the appendices were not included for these reasons: C101.1, D101.1, E101.1 and E103.1.

Also, Appendices A and B were not deleted as they are not directly referenced within the code currently and are still felt important to remain as appendices.

Analysis: The original code change is one of many individual code changes submitted in order to establish the status of the appendices versus the code. Instead of submitting public comments to each individual code change, the commenter has combined the relevant proposals into a single public comment which introduces the salient points of the appendices into the code itself.
Proposed Change as Submitted:

Proponent: Lawrence G. Perry, AIA; representing Building Owners and Managers Association International (BOMA)

Revise as follows:

Item 1


503.3.1 International Building Code. The following sections of the International Building Code -2000 shall constitute the Building Code materials and methods requirements for alterations Level 1:

1. The following sections of Chapter 7 entitled “Fire-resistant Materials and Construction”:
   i. Section 703.2
   ii. Section 703.3
   iii. Section 703.4
   3. Subsections 705.3, 705.8, 705.9, 705.10, 705.11

2. All of Chapter 8 entitled “Interior Finishes” except 802.


4. The following sections of Chapter 12 entitled “Interior Environment”:
   i. Section 1202.4.2 shall apply to new sources of contaminants.
   2. Section 1209

5. All of Chapter 14 entitled “Exterior Walls” except 1401, 1402, 1403.2.

6. All of Chapter 15 entitled “Roof Assemblies and Rooftop Structures” except 1501.1, 1502, 1503.4, 1503.5.

7. All of Chapter 24 entitled “Glass and Glazing”.

8. All of Chapter 25 entitled “Gypsum Board and Plaster”.

9. All of Chapter 26 entitled “Plastic”.

10. All of Chapter 30 entitled “Elevators and Conveying Systems”.

503.3.2 International Residential Code. The following sections of the International Residential Code - 2000 shall constitute the Residential materials and methods requirements for alterations Level 1:

1. The following sections of Chapter 3, entitled “Building Planning”:
   i. Section 307.2
   ii. Section 308
   iii. Section 318
   iv. Section 320
   v. Section 323
   vi. Section 324
   vii. Section 324

2. The following sections of Chapter 4 entitled “Foundations”:
   i. Section 402
   ii. Section 407

3. The following sections of Chapter 5 entitled “Floors”:
   i. Sections 502.1, 502.8, 502.11, 502.12.1
   ii. Sections 503.2.1, 503.2.3, 503.3.1, 503.3.3

4. The following sections of Chapter 6 entitled “Wall Construction”:
   i. Sections 602.1, 602.2, 602.6, 602.8.1
   ii. Sections 603.2.1, 603.2.2, 603.2.3, 603.2.4, 603.3.4, 603.3.5
   iii. Sections 604.1, 604.3
   iv. Section 605
   v. Section 606.1, 606.14
   vi. Sections 607.1
   vii. Section 608.1
   viii. Section 609.1
   ix. Sections 610.1, 610.2, 610.3
   x. Section 611.1
   xi. Section 612.1
   xii. Section 613.1

5. All of Chapter 7 entitled “Wall Covering”

6. The following section of Chapter 8, entitled “Roof-Ceiling Construction”:
   i. Section 802.1, 802.7, 802.10
   ii. Section 803.2.1
   iii. Sections 804.2.1, 804.2.2, 804.2.3, 802.2.4, 804.3.5, 804.3.6
   iv. Section 805.1

7. The following section of Chapter 9 entitled “Roof Assemblies”
   i. Section 902.1
   ii. Section 903.1
iii. Section 904
iv. Section 905
v. Section 906
vi. Section 907
vii. All of Chapter 10 entitled “Chimneys and Fireplaces”

503.3.5 International Plumbing Code. The following sections of the International Plumbing Code - 2000 shall constitute the plumbing materials and methods for alterations level 1.

1. All of Chapter 3 entitled “General Regulations”
   i. All of Chapter 3, entitled “General Regulations” except 303.5, 303.6, 303.7, 306, 309, 312

2. All of Chapter 4 entitled “Fixtures, Faucets and Fixture Fittings” except Section 403 and Table 403.1

3. All of Chapter 5 entitled “Water Heaters”

4. All of Chapter 6, entitled “Water Supply and Distribution” except sections 602.1, 604.3, 604.4, 604.5, 604.7, 604.10, 606.5.1 and Tables 604.3, 604.4, 604.5 and 604.10.1
   i. Water shall be supplied so that fixtures within a building are provided with an adequate supply of water so that they are functional.
   ii. Section 604.7 shall apply where there is not sufficient pressure for proper functioning of fixtures, a water pressure booster system shall be required
   iii. Section 604 shall apply for all newly-installed or completely replaced water services and for sizing water distribution systems when the proposed work will impose additional loads on the system. Where the proposed work does not increase or decreases the load on the existing system, no increase in size shall be required. All new piping associated with the installation of additional fixtures shall comply with the sizing requirements of Chapter 6.

5. All of Chapter 7 entitled “Sanitary Drainage” except Sections 708.3.3, 709, 710, and 711 and Tables 709.1, 709.2, 710.1(1), and 710.1(2)
   i. Sections 709, 710 for sizing drainage systems and sewer shall apply when proposed work will impose additional loads on the system. Where the proposed work does not increase or decreases the load on the existing system, no increase in size shall be required. All new piping associated with the installation of additional fixtures shall comply with the sizing requirements of 703.
   ii. Section 711 for sizing offsets in drainage systems shall apply when the proposed work will impose additional loads on the system. When the proposed work does not increase or decreases the load on the existing system, no increase in size shall be required.
6. All of Chapter 8 entitled “Indirect Waste”.

7. All of Chapter 9 entitled “Vents” except 901, 903, 905.4, 905.5, 912.2.3, 914, 916, 916.4, 916.5 and 907
   i. Section 903 for locations where vents are required shall apply where new stacks are being installed.
   ii. Section 916 for size and length of vents shall apply when new vents are being installed.

8. All of Chapter 10 entitled “Traps and Interceptors” except 1003.1, 1003.3.1, 1003.4, 1003.5, 1003.6, 1003.7, 1003.8 and 1003.9.

9. All of Chapter 11 entitled “Storm Drainage” except 1101.2, 1103.3, 1106.1, 1006.3, 1107, 1108
   i. Section 1101.2 for where storm water drains are required shall apply only when new roofs, paved areas, yards, courts and courtyards are created.
   ii. Section 1106.1 and 1106.3 for sizing roof drains shall apply only where additional roof area is to be drained or where other circumstances increase the load on existing roof drains. Where the proposed work does not increase or decreases the load on the size shall be required.

Item 2


1. All of Chapter 3, entitled “General Regulations” except 303.7 and 306.

2. All of Chapter 4, entitled “Gas Piping Installations” except 401.8 and 402.3
   i. Sections 401.8 and 402.3 shall apply when the work being performed increases the load on the system such that the existing pipe does not meet the size required by code. Existing systems that are modified shall not require resizing as long as the load on the system is not increased and the system length is not increased even if the altered system does not meet code minimums.

3. All of Chapter 5, entitled “Chimneys and Vents”

4. All of Chapter 6, entitled “Specific Appliances”

Proposed Change as Submitted:
Proponent: Ken Schoonover, P.E., KMS Associates, Inc
Add new text as follows:

506.1.1 Entrances. Accessible entrances shall be
provided in accordance with Section 1105.2 through 1105.9 of the International Building Code.

**Exception:** Where an alteration includes alterations to an entrance, and the building or facility has an accessible entrance, the altered entrance is not required to be accessible, unless required by Section 506.2. Signs complying with Section 1109 of the International Building Code shall be provided.

Renumber existing sections.

**Reason:** Coordination with the proposed ADAAG.

**Committee Action:** Disapproved

**Committee Reason:** The draft final rule of ADAAG is not a final document yet and the language in the IEBC should wait for the final ADAAG. The proposal involves major modifications for simple work.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Ken Schoonover, KMS Associates, Inc., requests Approval as Modified by this comment.

Modify proposal as follows:

506.1.8 Sleeping rooms and accommodations. Where I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 of the International Building Code for accessible units and Chapter 9 of the International Building Code for accessible alarms applied only to the quantity of spaces being altered or added.

**Commenter’s Reason:** It is appropriate to remove requirements for additions from Chapter 5 since adding units would be a Level 2 alteration and covered by Chapter 6. However, the proposal simply deletes “additions” from the section in Chapter 5 without adding
Infilling of floor openings, non-occupiable shall be permitted when units are added and the number of new units is not enough to provide the minimum number of accessible or Type A units required by the International Building Code, one is not required to alter any existing units. Approval as Modified is consistent with the proponent’s intent and maintains a useful clarification of the intended application of the code.

The proposed section number is based on the approval of EB38-02 which creates a new Section 605 on accessibility.

**EB95-02**

**Proposed Change as Submitted:**

Proponent: John M. Davis, Miami County, KS; representing Metropolitan Kansas City Chapter ICBO/ICC

**Revise as follows:**

902.2 Area limitations. No addition shall increase the area of an existing building beyond that permitted under the applicable provisions of Chapter 5 of the International Building Code for new buildings unless fire separation as required in the International Building Code is provided.

Exceptions:

1. Existing one and two story buildings shall be permitted to be expanded beyond what is permitted by up to 25 percent of the existing floor area, not to exceed an area of 125 percent of that permitted by the International Building Code, without providing fire separation.

2. Infilling of floor openings, non-occupiable appendages such as elevator and exit stair shafts, and the addition of mezzanines and equipment penthouses shall be permitted beyond that permitted by the International Building Code.

**Reason:** Allowing additions onto existing buildings that exceed the area limitations of the IBC is not warranted. Building height and area limitations should be controlled in the IBC and utilized in the IEBC by reference.

**Committee Action:** Disapproved

Committee Reason: Deletion of exception 1 and parts of exception 2 removes the additional needed flexibility.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

J. Michael Davis and Ron R. Worley, Miami County, KS and City of Lenexa, KS; representing Metropolitan Kansas City Chapter ICBO/ICC request Approval as Submitted.

Commenter’s Reason: There were five (5) proposals to change this provision of the IEBC under consideration at the Pittsburgh hearings. The IEBC Committee denied each proposal. The committee was consistent in their reason for denying each of the proposals in that, “Deletion or Modification of Exception(s) removes the additional needed flexibility”. Needed flexibility? Where was the committee during the drafting and debate during the development of the IBC?

The IBC contains the basic area provisions and requirements for allowed area increases based upon type of construction, distance to property lines or inclusion of sprinkler systems in a building. Limiting the area of a building has been a basic provision in each of the model codes for decades. For the IEBC to allow a 25 percent increase in the allowed area only because the building is “EXISTING” provides no equivalency to the intent for protection or separation of buildings contained in the IBC.

Another point of concern on this proposal is; when does a building become an “Existing Building”? Upon the issuance of a Certificate of Occupancy? So, if a building owner or design professional want a building that exceeds the area allowed by the IBC all they need to do is finish construction of a building to the maximum area allowed by the IBC then immediately apply for a permit for an addition for the additional 25 percent area? This change could hypothetically allow a backdoor for some designers or developers to circumvent the requirements for a higher type of construction, distance to property line or installing fire sprinklers. There are far too many loopholes and potential for problems with this code provision as approved by the IEBC Committee.

There is absolutely no reason to allow area increases beyond that specified in the International Building Code. If the IEBC Committee wishes to argue that the IBC is too restrictive they should submit a code change and present their arguments to the IBC Code Committee and to this body of Building Officials for consideration.

Allowed area and area increases is best left where it belongs, in the International Building Code.

**EB100-02**

**Proposed Change as Submitted:**

Proponent: John M. Davis, Miami County, KS; representing Metropolitan Kansas City Chapter ICBO/ICC
Revise as follows:

904.2 Smoke alarms in existing portions of building. Whenever an addition is made to a building or structure of Use Group R-3 or R-4, the existing building shall be provided with smoke alarms as required by the International Building Code or the International Residential Code as applicable. The smoke alarms are not required to be interconnected.

Reason: The second sentence of this provision is in direct conflict with Section 907.2.10.2 and 907.2.10.2 of the IBC and Section R317.1.1 and R317.1.2 of the International Residential Code. Reference to the code provisions of the major codes is adequate.

Committee Action: Disapproved

Committee Reason: The proposal still does not clarify what smoke alarms are to be interconnected and what smoke alarms are not required to be interconnected.

Assembly Action: No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

J. Michael Davis and Ron R. Worley, Miami County, KS and City of Lenexa, KS; representing Metropolitan Kansas City Chapter ICBO/ICC request Approval as Submitted.

**Commenter’s Reason:** The reason given for the committee action for disapproval was that “The proposal still does not clarify what smoke alarms are to be interconnected and what smoke alarms are not required to be interconnected.” Rather than trying to clarify where smoke alarms should be required to be hardwired and interconnected the committee is attempting to grant a very broad exception that is unacceptable and would result in a several year step back of a basic safety feature of the codes that has been proven to save many lives.

Both the IRC and IBC contain basic requirements for hardwiring and interconnection of smoke alarms in existing buildings and try to explain where interconnection is required when existing buildings are being renovated or having an addition constructed. IRC Section R317.1.1 including exception 1 provide some basic guidelines for the hardwiring and interconnection of smoke alarms in one and two family dwellings where “interior alterations, repairs or additions occur.” While the language is not perfect it is sufficient for a building official to use some judgment and require hardwiring and interconnection of smoke detectors when it is determined to be reasonable.

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**EB112-02**

**Proposed Change as Submitted:**

**Proponent:** John M. Davis, Miami County, KS; representing Metropolitan Kansas City Chapter ICBO/ICC

**Delete without substitution:**

**CHAPTER 11**
**RELOCATED OR MOVED BUILDINGS**

**SECTION 1101**
**GENERAL**

1101.1 Scope. This chapter provides requirements for relocated or moved structures.

1101.2 Conformance. The building shall be safe for human occupancy as determined by the International Fire Code and the International Property Maintenance Code. Any repair, alteration or change in occupancy undertaken within the moved structure shall comply with the requirements of this code applicable to the work being performed. Any field fabricated elements shall comply with the requirements of the International Building Code.

**SECTION 1102**
**REQUIREMENTS**

1102.1 Location on the lot. The building shall be located on the lot in accordance with the requirements of the International Building Code or the International Residential Code as applicable.

1102.2 Foundation. The foundation system of relocated buildings shall comply with the International Building Code.

1102.2.1 Connection to the foundation. The connection of the relocated building shall comply with the International Building Code.


**Exceptions:**

1. Detached one and two family dwellings and Group U Occupancies where wind loads at the new location are not higher than the previous location.

2. Structural elements whose stress is not increased by more than 5 percent.

1102.4 Seismic loads. Building shall comply with International Building Code seismic provisions at the new location.
Exceptions:

5. All structures in Seismic Design Categories A and B, and detached one and two family dwellings in Seismic Design Categories A, B and C where the seismic loads at the new location are not higher than the previous location.

6. Structural elements whose stress is not increased by more than 5 percent

1102.5 Snow loads. Structure shall comply with International Building Code snow loads where snow loads at the new location are higher than the previous location.

Exception: Structural elements whose stress is not increased by more than 5 percent

1102.6 Flood hazard areas. If relocated or moved into a flood hazard area, structures shall comply with International Building Code Section 1612.

1102.7 Required inspection and repairs. The code official shall be authorized to inspect, or require inspection by approved professionals at the expense of the owner, the various structural parts of a relocated building to verify that structural components and connections have not sustained structural damage. Any repairs required by the code official as a result of such inspection shall be made prior to the final approval.

Reason: Chapter 11 should not be included in the IEBC. If a building is moved into or within a jurisdiction is it existing? The IBC and IRC have no provisions dealing with moving existing buildings and conflicting provisions in the IEBC are not needed.

Committee Action: Disapproved

Committee Reason: Relocated buildings are existing buildings and their regulations should be part of the IEBC.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

J. Michael Davis and Ron R. Worley, Miami County, KS and City of Lenexa, KS; representing Miami County, KS and Metropolitan Kansas City Chapter ICBO/ICC request Approval as Submitted.

Commenter’s Reason: Traditionally the UBC and the IBC have required that buildings moved into or to a new location in a jurisdiction conform to the requirements for new buildings. Section 3407 of the IBC requires “Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures.” A building that is either moved into or is moved to a new location within a jurisdiction is not an existing building and should not be given the same consideration for liberal acceptance of its construction in its placement, repair or rehabilitation as a building that is truly “existing” at an established location within a jurisdiction.

For example in my jurisdiction, Miami County, KS, we have received applications for moving three houses from an adjoining County into our jurisdiction. The way the IEBC currently is written I would have to accept existing non-hard-wired smoke-detection systems, non-complying emergency egress from bedrooms and possibly even basic structural deficiencies because the building is considered to be an “Existing Building”. An existing building in my opinion is a building that was constructed on a site and is not moved or relocated, and the use of the building is not changed, much the same as a “Nonconforming Use” is treated in Zoning. As long as it stays in the same location without any change in use or occupancy it does not need to be improved or changed in any way. But as soon as the building undergoes a substantial change or is moved, it loses its nonconforming status and must comply fully with current regulations. People like to call this grandfathering, and I often warn them that grandpa is old and substantial change can kill him.

The Chair of the IEBC Committee proposed to the IBC General Requirements Committee to delete Chapter 34 in its entirety and to refer code officials to the IEBC for requirements. The IBC Committee approved the proposal so in addition to this challenge that is before us now I have filed a challenge to the IBC General Committees action approving the IEBC Chair’s proposal for eliminating a code that I am comfortable with for a code that is untried.

EB116-02

Proposed Change as Submitted:

Proponent: Garrett A. Stone, Brickfield, Burchette Ritts & Stone, PC; representing Cardinal Glass Industries

Add new text as follows:

CHAPTER 14
ENERGY EFFICIENCY

1401. General.

1401.1 Scope. This chapter governs the design and construction regarding existing buildings (including alterations and replacement fenestration) for energy efficiency.

1401.1.1 Design and construction regarding existing buildings shall be in accordance with the International Energy Conservation Code.

Renumber existing sections.

Reason: The IECC contains energy efficiency provisions for existing buildings (see IECC Section 101.4.2). This proposal will ensure that existing buildings will be technically consistent with the other ICC
codes. We have used the same basic format as used by the IBC for referencing the IECC (see Chapter 13 of the IBC). Given that the IECC already expressly applies to existing buildings and this approach is not intended to expand that application, this proposal will not increase construction cost.

Committee Action: Disapproved

Committee Reason: The goal of the IEBC is to encourage improvements in existing buildings and the proposal potentially hampers such improvements. The IEBC Drafting Committee proposed change EC3-02 to the International Energy Conservation Code sends the code user to the IEBC for work in existing buildings. If EC3-02 passes, there will be a do loop created between the IECC and the IEBC.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter’s Reason: The IEBC does not fully address energy efficiency as a factor in making improvements to existing buildings. This code proposal would refer IEBC users to the IECC for energy efficiency provisions applicable to existing buildings, where provisions that satisfactorily address energy efficiency for existing buildings have already been adopted. These provisions are easy to use and adequately take into account the nuances of existing structures.

Adopting a reference to the IECC in the IEBC, as proposed in EB 116-02, will ensure that the I-Codes are consistent with one another in applying energy efficiency provisions for buildings. The IECC contains comprehensive provisions for energy efficiency in all buildings, including existing structures, which have been debated and discussed over a number of years in front of the IECC Committees by the nation’s leading experts in energy efficient for residential and commercial, new and existing buildings. A failure to adopt these IECC provisions creates a discrepancy between the codes that could confuse I-Code users and will cause the IEBC to be incomplete. There is no reason for the IEBC to re-invent the wheel with respect to energy provisions, in light of the fact that the IECC - the DOE - certified national model energy code - already contains such provisions. The IECC should adopt the same approach that is already utilized in the IBC by creating an energy efficiency chapter and adopting by reference the IECC as its energy efficiency provisions. (The IRC has adopted a similar approach by incorporating the IECC by reference, and it has gone further by reprinting a simplified energy efficiency chapter, which is found in Chapter 6 of the IECC.)

The IEBC drafting committee expressed concern in its disapproval of this code proposal that, if it passed and if another code proposal, EC3-02, also passed, the two code provisions would work to send users of the IECC to the IEBC, and back again, without providing any real direction. In practice, this would not have been the case because the proposed EC3-02 would not have been able to circumvent the IECC energy efficiency provisions. Instead, this proposal would have sent IECC users to the IEBC for building standards not addressed in the IECC (i.e., non-energy related provisions) and EB116-02 would have sent IEBC users to the IECC for energy related provisions. EC3-02 did not pass because the IECC Committee believed the IEBC was still in a draft form and the clear delineation of authority between energy and non-energy provisions in the IECC and IEBC did not exist in EC3-02. Also, the IECC committee was concerned with the IEBC committee’s disapproval of EB116-02. Regardless, the final action on EC3-02 is irrelevant to the decision on whether the IEBC should contain the IECC energy efficiency provisions for existing buildings as specified in this proposal.

In summary, because the IECC already contains comprehensive energy efficiency provisions for existing buildings, which are currently nonexistent in the IEBC, and because the IECC energy efficiency provisions for existing buildings as they are currently written and applied do not conflict with the other provisions in the IEBC, this code proposal should be adopted as submitted.
S20-02
1609.1.1, 2301.2.3, 2308.1, 2308.2.1

Proposed Change as Submitted:

Proponent: David P. Tyree, P.E., C.B.O., American Forest & Paper Association

Revise as follows:

1. 1609.1.1 (Supp) Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Section 6 of ASCE 7.

Exceptions:
No change to exceptions 1 and 2.

3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF & PA Wood Frame Construction Manual for One and Two Family Dwellings, SBC High Wind Edition.

No change to exceptions 4 and 5.

1609.1.1.1 Applicability. The provisions of SSTD 10 and the AF & PA Wood Frame Construction Manual for One and Two Family Dwellings, SBC High Wind Edition are applicable only to buildings located within Exposure A, B or C as defined in Section 1609.4. The provisions of SSTD 10 and the AF & PA Wood Frame Construction Manual for One- and Two-Family Dwellings shall not apply to buildings sited on the upper half of an isolated hill, ridge or escarpment meering the following conditions:

Remainder of section unchanged.

2. 2301.2.3 Conventional light-frame wood construction. The design and construction of conventional light-frame wood construction shall be accordance with the provisions of Sections 2304 and 2308.

Exception: Buildings designed in accordance with the provisions of the AF and PA Wood Frame Construction Manual for One- and Two-Family Dwellings shall be deemed to meet the requirements of the provisions of Section 2308.

3. 2308.1 General. The requirements in this section are intended for conventional, light-frame construction. Other methods are permitted to be used provided a satisfactory design is submitted showing compliance with other provisions of this code. Interior nonload-bearing partitions, ceilings and curtain walls of conventional light-frame construction are not subject to the limitations of this section. Alternatively compliance to the following standards shall be permitted subject to the limitations therein and the limitations of this code: American Forest and Paper Association (AF & PA) Wood Frame construction Manual for One- and Two-Family Dwellings.

4. 2308.2.1 Basic wind speed greater than 100 mph (3-second gust). Where the basic wind speed exceeds 100 mph (3-second gust) the provisions of the AF & PA Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM), or the provisions of the SBCCI Standard for Hurricane Resistant Residential Construction SSTD-10, are permitted to be used.

5. Revise Chapter 35 referenced standard as follows:

<table>
<thead>
<tr>
<th>AF&amp;PAA</th>
<th>Referred Standard in code number</th>
<th>Title section number</th>
</tr>
</thead>
</table>

Proponent's Reason: AF & PA's Wood Frame Construction Manual (WFCM), which the IRC currently recognizes as an alternative to formal design in high-wind areas, has been revised to address high-seismic and high-snow loading as well as high-wind. This proposal would permit the use of the WFCM in lieu of the IBC’s structural requirements in all applications. Additionally, the format of this change would permit the listing of similar documents by other industries.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Clifford M. Skogstad, City of St. Michael; representing Minnesota Building Officials, requests Disapproved.
Commenter's Reason: No justification was submitted that the AFPA wood frame construction manual is equivalent to IBC 2308. What qualifications and representation are associated with the committee that drafted the design manual?

S25-02
1609.7.2 (IRC R905.2.6)

Proposed Change as Submitted:

PropONENT: David L. Roodvoets, DLR Consultants; representing ARMA

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IBC 1609.7.2 Roof coverings. Roof coverings shall comply with Section 1609.7.1.

   Exception: Rigid tile roof coverings that are air-permeable and installed over a roof deck complying with Section 1609.7.1 are permitted to be designed in accordance with Section 1609.7.3.

Asphalt shingles that are air permeable and installed over a roof deck complying with Section 1609.7.1 are permitted to be designed using UL 2390 to determine appropriate uplift and force coefficients applied to the shingle.

2. IRC R905.2.6 (Supp) Attachment. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer. For normal application, asphalt shingles shall be secured to the roof with not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 20 units vertical in 12 units horizontal (20:12), special methods of fastening are required. For roofs located where the basic wind speed per Figure R301.2(4) is 110 mph (177 km/h) or greater, special methods of fastening are required. Special fastening methods shall be tested in accordance with ASTM D 3161, modified to use a wind speed of 110 mph (177 km/h).

Asphalt shingles that are air permeable and installed over a roof deck complying with International Building Code Section 1609.7.1 are permitted to be designed using UL 2390 to determine appropriate uplift and force coefficients applied to the shingle.

3. IBC Add referenced standard to Chapter 35 as follows:

   UL
<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Referenced in code number</th>
<th>Title section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 2390</td>
<td></td>
<td>Test Methods for Measuring Wind Uplift Coefficients of Asphalt Shingles 1609.7.2</td>
</tr>
</tbody>
</table>

4. IRC Add referenced standard to Chapter 43 as follows:

   UL
<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Referenced in code number</th>
<th>Title section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 2390</td>
<td></td>
<td>Test Methods for Measuring Wind Uplift Coefficients of Asphalt Shingles</td>
</tr>
</tbody>
</table>

   Proponent's Reason: Shingles are air permeable and are not subject to the full load of the wind uplift forces. A laboratory test has been developed that measures the uplift forces on the shingle sealant strip. This test should be used to determine the loads on the shingle. Tests exist such as UL 6131 that demonstrate the resistance to the loads that will be determined with this test.

   Cost Impact: This test will add a small amount of cost to the use of the shingles.

   Analysis: A review of the draft of the proposed reference standard indicates compliance with Section 3.6 of the ICC code development process. Proponent should advise the committee as to when the standard is to be finalized and readily available.

ITEMS 1 & 3 (IBC)
Committee Action: Approved as Modified

Modify item 1 of proposal as follows:

1609.7.2 Roof coverings. Roof coverings shall comply with Section 1609.7.1.

   Exception:
   1. Rigid tile roof coverings that are air-permeable and installed over a roof deck complying with Section 1609.7.1 are permitted to be designed in accordance with Section 1609.7.3;

   2. Asphalt shingles that are air permeable and installed over a roof deck complying with Section 1609.7.1 are permitted to be designed using UL 2390 to determine appropriate uplift and force coefficients applied to the shingle.

Item 3 approved as proposed

Committee Reason: Agreement with the proponent’s published reason. The modification more appropriately reflects the new text as an exception.

Assembly Action: No Motion

ITEMS 2 & 4 (IRC)
Committee Action: Disapproved
Committee Reason: This is a prescriptive code and this proposal would require a design for the shingles. The committee prefers the prescriptive requirements.

Staff Note: If the final version of the standard is not readily available and received for staff review by the deadline for receiving public comments, S25-02 will be placed on the Final Action Individual Consideration Agenda.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the International Building Code. Also the final version of the standard, UL 2390, as proposed, was not submitted for staff review prior to the end of the public comment period.

Suggested Scoping Modification of Item 2 for coordination with committee modification of Item 1. See page vi for procedural details.

2. IRC R905.2.6 (Supp) Attachment. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer. For normal application, asphalt shingles shall be secured to the roof with not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 20 units vertical in 12 units horizontal (20:12), special methods of fastening are required. For roofs located where the basic wind speed per Figure R301.2(4) is 110 mph (177 km/h) or greater special methods of fastening are required. Special fastening methods shall be tested in accordance with ASTM D 3161, modified to use a wind speed of 110 mph (177 km/h).

Exception: Asphalt shingles that are air permeable and installed over a roof deck complying with International Building Code Section 1609.7.1 are permitted to be designed using UL 2390 to determine appropriate uplift and force coefficients applied to the shingle.

Analysis: The following combinations of actions would achieve technical consistency between the IBC and the IRC:

- Items 1 & 3 AS Items 2 & 4 AS
- Items 1 & 3 D Items 2 & 4 D
- Items 1 & 3 AM Items 2 & 4 AM

S26-02 T1610.1

Proposed Change as Submitted:

Proponent: Stephanie J. Young, P.E., National Council of Structural Engineers Associations (NCSEA); representing NCSEA Code Advisory Committee - General Engineering Subcommittee

Revise as follows:
### TABLE 1610.1
SOIL LATERAL LOAD

<table>
<thead>
<tr>
<th>DESCRIPTION OF BACKFILL*</th>
<th>UNIFIED SOIL CLASSIFICATION</th>
<th>DESIGN OF LATERAL SOIL LOAD* (pound per square foot per foot of depth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-graded, clean gravels; gravel-sand mixes</td>
<td>GW</td>
<td>30** 35**</td>
</tr>
<tr>
<td>Poorly graded clean gravels; gravel-sand mixes</td>
<td>GP</td>
<td>30** 35**</td>
</tr>
<tr>
<td>Silty gravels, poorly graded gravel-sand mixes</td>
<td>GM</td>
<td>30** 35**</td>
</tr>
<tr>
<td>Clayey gravels, poorly graded gravel-and-clay mixes</td>
<td>GC</td>
<td>45**</td>
</tr>
<tr>
<td>Well-graded, clean sands; gravelly sand mixes</td>
<td>SW</td>
<td>30** 35**</td>
</tr>
<tr>
<td>Poorly graded clean sands; sand-gravel mixes</td>
<td>SP</td>
<td>30** 35**</td>
</tr>
<tr>
<td>Silty sands, poorly graded sand-silt mixes</td>
<td>SM</td>
<td>45**</td>
</tr>
<tr>
<td>Sand-silt clay mix with plastic fines</td>
<td>SM-SC</td>
<td>46** 85**</td>
</tr>
<tr>
<td>Clayey sands, poorly graded sand-clay mixes</td>
<td>SC</td>
<td>60** 85**</td>
</tr>
<tr>
<td>Inorganic silts and clayey silts</td>
<td>ML</td>
<td>45** 85**</td>
</tr>
<tr>
<td>Mixture of inorganic silt and clay</td>
<td>ML-CL</td>
<td>60** 85**</td>
</tr>
<tr>
<td>Inorganic clays of low to medium plasticity</td>
<td>CL</td>
<td>40** 100**</td>
</tr>
<tr>
<td>Organic silts and silt clays, low plasticity</td>
<td>OL</td>
<td>**</td>
</tr>
<tr>
<td>Inorganic clayey silts, elastic silts</td>
<td>MH</td>
<td>**</td>
</tr>
<tr>
<td>Inorganic clays of high plasticity</td>
<td>CH</td>
<td>**</td>
</tr>
<tr>
<td>Organic clays and silty clays</td>
<td>OH</td>
<td>**</td>
</tr>
</tbody>
</table>

For SI: 1 pound per square foot per foot of depth = 0.157 kPa/m, 1 foot = 304.8 mm.

No change to footnotes.

**Proponent’s Reason:** Revise active soil pressure lateral loads in accordance with ASCE 7-98 Table 5-1.

**Committee Action:** Approved as Submitted

**Committee Reason:** It is preferable to adopt the values from ASCE 7, so that there is a single set of soil pressures to be used nationally (rather than two). The tabulated values are for use in the absence of a soils report and it is appropriate that they be conservative.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because public comments were submitted.

**Public Comment 1:**

Charles Clark, AIA, P.E., National Concrete Masonry Association (NCMA); representing Masonry Alliance for Codes and Standards (MACS), requests Disapproved.

**Commenter’s Reason:**

1. No Foundation Wall Failures
   The proponent has shown no data to support that the new soil loads are needed. These are the same values as used in two previous model codes (BOCA and Standard Building Code) with the third (UBC) not listing values. There have been countless basement walls designed using the existing soil load values and yet no documentation of failures has been submitted to justify the increase in lateral loads. Where are the failures? Why must we significantly increase the cost of construction when the existing values have not been proven wrong?

2. Conflicts with Other IBC Code Text
   The Prescriptive Foundation Tables 1805.5(1) through 1805.5(4) are based on the existing soil classifications and lateral soil loads from Table 1610.1. Thus the foundation tables use the following soil classifications and loads as a basis:

<table>
<thead>
<tr>
<th>Unified Soil Classification</th>
<th>Lateral Soil Load (pounds per square foot per foot of depth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW, GP, SW, SP</td>
<td>30</td>
</tr>
<tr>
<td>GM, GC, SM, SM-MC, ML</td>
<td>45</td>
</tr>
<tr>
<td>SC, MH, ML-CL, CL</td>
<td>60</td>
</tr>
</tbody>
</table>

Both tables equate a given soil classification with a lateral soil load. Yet if this change is approved, the lateral loads used by the prescriptive tables would be significantly different than those used by the soil table. This creates a contradiction in the code text. Thus for example for soil classifications SC and ML-CL, the prescriptive table would use a value
of 60 psf whereas the soil load table would use a value of 85 psf. For SM-SC and ML, the prescriptive table would use a value of 45 psf whereas the soil load table would use a value of 85 psf. This is confusing and contradictory. It leaves the designer wondering which set of values to choose for the given soil classification. This code change should be denied for this reason alone.

The proposal should be disapproved for these reasons. 

**Public Comment 2:**

**Joepsh Knarich, National Association of Home Builders, requests Disapproved.**

**Commenter’s Reason:** The proposed change seeks to revise the lateral soil pressures required by IBC Table 1610.1 to agree with those currently contained in ASCE 7-98. The committee accepted the overly conservative ASCE values even though there was no data provided to show that a significant number of foundation wall failures, if any, have resulted from use of the current IBC values for lateral soil pressure. The IBC Structural Drafting Committee and the ICC membership previously rejected attempts by proponents to incorporate these overly conservative lateral soil pressures into the IBC. NAHB requests that the ICC membership once again reject this proposal that, if accepted, would serve only to provide for thicker and/or more heavily reinforced foundation walls and increase construction costs without providing any demonstrated need.

**Public Comments 3 & 4:**

**Robert W. Clements Jr., Chesterfield County; representing VA Building and Code Officials Association and Joseph J. Messersmith, Jr., Portland Cement Association, request Disapproved.**

**Commenter’s Reason:** The committee’s reason for recommending approval of this change states that: “It is preferable to adopt the values from ASCE 7, so that there is a single set of soil pressures to be used nationally (rather than two).”

Approving the change will mean that the IBC is the only code that uses the values from ASCE 7. None of the three model building codes use the ASCE 7 values. The BOCA NBC and SBC use the same values as presently found in the IBC, as does the new NFPA 5000 building code. The UBC has no specific values. Contrary to the committee’s reason, presently there is one set of lateral soil pressures in use in this country, and it is the same as found in the existing IBC. Approving this change will mean that there will be two sets.

The committee’s reason goes on to state that: “The tabulated values are for use in the absence of a soils report and it is appropriate that they be conservative.”

Determining the value of lateral soil pressure to be used to design a basement wall is more of an art than a science. Several geotechnical engineers are apt to give you several values for the same soil conditions, and the values they assign will usually be very conservative. Because of the imprecise natural of determining lateral soil loads, ASCE 7 and the IBC require that a load factor of 1.6 be applied to lateral soil pressure, $H$, for strength design. Therefore, the already conservative load is further increased by 60%. On the other hand, where loads can be more accurately determined, a much lower load factor is required. For example, in the case of fluid pressure, $F$, where the maximum height of the fluid is well-defined, the load factor is only 1.2.

Despite the fact that millions of basement walls have been designed according to the same values currently in the IBC, and despite the fact that no data was submitted to show that these walls are failing due to inadequate design loads, the change is being recommended for approval for consistency with ASCE 7. This reason alone does not justify the change.

Additionally this change will cause an inconsistency between 1610.1 and 1805.5(1).

For the reasons stated, the proposal should be disapproved.

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**S27-02**

**1610.1, T1610.1**

**Proposed Change as Submitted:**

**Proponent:** Stephanie J. Young, P.E., National Council of Structural Engineers Associations (NCSEA); representing NCSEA Code Advisory Committee - General Engineering Subcommittee

**Revise as follows:**

1. **1610.1 (Supp) General.** Basement, foundation, and retaining walls shall be designed to resist lateral soil loads. Soil loads specified in Table 1610.1 shall be used as the minimum design lateral soil loads unless specified otherwise in a soil investigation report approved by the building official. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for At-Rest-Pressure. Retaining walls free to move and rotate at the top may be designed for Active Pressure. Design lateral pressure from surcharge loads shall be added to the lateral earth pressure load. Design lateral pressure shall be increased if soils with expansion potential are present at the site.
**TABLE 1610.1**

SOIL LATERAL LOAD

<table>
<thead>
<tr>
<th>DESCRIPTION OF BACKFILL*</th>
<th>UNIFIED SOIL CLASSIFICATION</th>
<th>DESIGN OF LATERAL SOIL LOAD* (pound per square foot per foot of depth)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ACTIVE PRESSURE</td>
</tr>
<tr>
<td>Well-graded, clean gravels; gravel-sand mixes</td>
<td>GW</td>
<td>30°</td>
</tr>
<tr>
<td>Poorly graded clean gravels; gravel-sand mixes</td>
<td>GP</td>
<td>30°</td>
</tr>
<tr>
<td>Silty gravels, poorly graded gravel-sand mixes</td>
<td>GM</td>
<td>40°</td>
</tr>
<tr>
<td>Clayey gravels, poorly graded gravel-and-clay mixes</td>
<td>GC</td>
<td>45°</td>
</tr>
<tr>
<td>Well-graded, clean sands; gravelly sand mixes</td>
<td>SW</td>
<td>30°</td>
</tr>
<tr>
<td>Poorly graded clean sands; sand-gravel mixes</td>
<td>SP</td>
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</tr>
<tr>
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<tr>
<td>Sand-silt clay mix with plastic fines</td>
<td>SM-SC</td>
<td>45°</td>
</tr>
<tr>
<td>Clayey sands, poorly graded sand-clay mixes</td>
<td>SC</td>
<td>60°</td>
</tr>
<tr>
<td>Inorganic silts and clayey silts</td>
<td>ML</td>
<td>45°</td>
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<td>ML-CL</td>
<td>60°</td>
</tr>
<tr>
<td>Inorganic clays of low to medium plasticity</td>
<td>CL</td>
<td>60°</td>
</tr>
<tr>
<td>Organic silts and silt clays, low plasticity</td>
<td>OL</td>
<td>b</td>
</tr>
<tr>
<td>Inorganic clayey silts, elastic silts</td>
<td>MH</td>
<td>b</td>
</tr>
<tr>
<td>Inorganic clays of high plasticity</td>
<td>CH</td>
<td>b</td>
</tr>
<tr>
<td>Organic clays and silty clays</td>
<td>OH</td>
<td>b</td>
</tr>
</tbody>
</table>

For SI: 1 pound per square foot per foot of depth = 0.157 kPa/m, 1 foot = 304.8 mm.

Design lateral soil loads are given for moist conditions for the specified soils at their optimum densities. Actual field conditions shall govern. Submerged or saturated soil pressure shall include the weight of the buoyant soil plus the hydrostatic loads.

Unsuitable as backfill material.

For relatively rigid walls, as when braced by floors, the design lateral soil load shall be increased for sand and gravel type soils to 60 pounds per square foot per foot of depth. Basement walls extending not more than 8 feet below grade and supporting flexible floor systems are not considered as being relatively rigid walls.

For relatively rigid walls, as when braced by floors, the design lateral load shall be increased for silt and clay type soils to 100 pounds per square foot per foot of depth. Basement walls extending not more than 6 feet below grade and supporting flexible floor systems are not considered as being relatively rigid walls.

Proponent’s Reason: Currently, Table 1610.1 supplies the soil lateral loads for basement type walls in footnotes to the table. These footnotes could be overlooked, thus causing an under-design of the wall. This change creates a second column in the table for those loads, and clearly defines the appropriately usage of each column, by defining the loads as being from Active or At-Rest Pressures, for Retaining and Basement walls, respectively in Section 1610.1.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Joseph Knarich, National Association of Home Builders, requests Approved as Modified by this comment.

Modify item 1 of proposal as follows:

Add the following exception to Section 1610.1:

**Exception:** Basement walls extending not more than 8 feet below grade and supporting flexible floor systems shall be permitted to be designed for Active Pressure.

Remainder of item 1 as previously approved.

Item 2 as previously approved.

Commenter’s Reason: The proposed modification will restore the
exception allowed for basement walls extending not more than 8 feet below grade and supporting flexible floor systems. Table 5-1 of ASCE 7-98, which is the basis for notes “c” and “d” deleted by this proposal, clearly states that basement walls meeting these conditions are not be considered to be relatively rigid walls and therefore are permitted to be designed using the Active Pressure values. The proponent provided no justification for eliminating this exception, and its elimination will result in an inconsistency with the current requirements of ASCE 7. If approved as submitted, this proposal will require shallow foundation walls typically used in residential construction to be designed for the much higher values for At-Rest Pressure and will greatly increase construction costs without demonstrated need.

*Public Comment 2:*

Charles Clark, AIA, P.E., National Concrete Masonry Association (NCMA); representing Masonry Alliance for Codes and Standards (MACS), requests **Disapproved.**

**Commenter’s Reason:**

1. **No Foundation Wall Failures**
   The proponent has shown no data to support that the new soil loads are needed. The proposed values listed in the table as “At-Rest Pressure” are already indicated in the footnote of the existing table. The existing table uses the same values as used in two previous model codes (BOCA and Standard Building Code) with the third (UBC) not listing values. The proponent claims that the footnote could be overlooked yet does not provide any cases where this has occurred. If this is such a problem, there should be no trouble finding examples of failed walls. Yet no documentation of wall failures has been submitted to justify the increase in lateral loads. Why significantly increase the cost of walls when the existing soil load values present no problems?

2. **Conflicts with ASCE 7-02**
   If the footnotes are deleted from Table 1610.1, the table will no longer be consistent with ASCE 7. In both ASCE 7 and the existing IBC Table 1610.1, by removing the footnote, basement walls 8 feet high or less would be required to be designed for the higher at-rest pressure. Yet no justification for this increase has been cited.

3. **Table Requirements More Stringent**
   Both the footnotes in ASCE 7 and those found in the existing IBC Table 1610.1 clarify that these higher at-rest pressures are not required for basement walls 8 feet high or less. Yet this code change requires that all basement walls be designed for the higher at-rest pressure whether they are above or below 8 feet. This is more stringent than either ASCE 7 or the existing IBC text. Yet no documentation has been shown to substantiate these higher requirements. The proponent’s misleading reason statement indicates that they are merely incorporating the footnote text into the table when in fact they are increasing the table’s requirements. For this reason alone, the code change should be denied.

For these reasons, the proposal should be disapproved.

**Public Comments 3 & 4:**

Ronald W. Clements Jr., Chesterfield County; representing VA Building and Code Officials Association and Joseph J. Messersmith, Jr., Portland Cement Association, request **Disapproved.**

**Commenter’s Reason:** This proposal will require that all basement walls (i.e., walls which are restricted from moving laterally at the top) be designed for “at-rest” earth pressures. The new values of “at-rest” pressure being added to Table 1610.1 are 60 and 100 psf per foot of depth, depending upon class of soil. The existing values in Table 1610.1 (presumably modified according to S26-02 if it is approved), to be termed “active pressure,” will apply to the design of retaining walls (i.e., a wall that is free to move laterally and rotate at the top).

A comparison of the values in the two columns of the table in the proposal will show that for some classes of soils, the design lateral load will more than double (e.g., (100/45) = 2.22). Despite the fact that millions of basement walls have been designed according to the values currently in the IBC and other codes, and despite the fact that no data was submitted to show that these walls are failing due to inadequate design lateral soil loads, the change is being recommended for approval.

The proponent of S27 also submitted S26-02, the purpose of which was to achieve consistency between the IBC and ASCE 7. This proposal will undo the consistency they hoped to achieve with S26-02. They can’t have it both ways.

For the reasons stated, the proposal should be disapproved.

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**S33-02**

1614.1.1, 1614.2, 1614.3, 2308.10.7.3, G102.1

**Proposed Change as Submitted:**

**Proponent:** John Terry, IEBC Drafting Committee

**Revise as follows:**

1. **1614.1.1 Additions to existing buildings.** An addition that is structurally independent from an existing structure shall be designed and constructed as required for a new structure in accordance with the seismic requirements for new structures. An addition that is not structurally independent from an existing structure shall be designed and constructed such that the entire structure conforms to the seismic force resistance requirements for new structures unless the following conditions are satisfied:
   1. The addition conforms with the requirements for new structures, and
   2. The addition does not increase the seismic forces in any structural element of the existing structure by more than 5 percent, unless the element has the capacity to resist the increased forces determined in accordance with Sections 1613 through 1622, in accordance with Section 903 of the International Existing Building Code.

2. **1614.2 Change of occupancy.** When a change of occupancy results in a structure being reclassified to a higher Seismic Use Group, the structure shall conform to the seismic requirements for a new structure.

**Exception:**

Specific detailing provisions required for a new structure are not required to be met where it can be shown an equivalent level of performance and seismic safety contemplated for a new structure is obtained. Such
Existing buildings undergoing a change of occupancy shall comply with the seismic requirements of Section 807.3 of the International Existing Building Code.

3. **1614.3 Alterations.** Existing structures being altered need not comply with Sections 1613 through 1622 provided that the following conditions are met:
   1. The alterations do not create a structural irregularity as defined in Section 1616.5 or make an existing structural irregularity more severe.
   2. The alteration does not increase the seismic forces in any structural element of the existing structure by more than 5 percent, unless the capacity of the element subject to the increased forces is still in compliance with Sections 1613 through 1622.
   3. The alteration does not decrease the seismic resistance of any structural element of the existing structure to less than that required for a new structure.
   4. The alterations do not result in the creation of an unsafe condition.

Existing buildings undergoing alterations or repairs shall comply with the applicable seismic provisions in the International Existing Building Code.

4. **2308.10.7.3 Alterations to trusses.** Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g., HVAC equipment, water heater) shall not be permitted without verification that the truss is capable of supporting such additional loading; comply with the applicable structural requirements identified in the International Existing Building Code.

5. **G102.1 General.** This appendix, in conjunction with the International Building Code and the International Existing Building Code, provides minimum requirements for development located in flood hazard areas, including the subdivision of land, installation of utilities, placement and replacement of manufactured homes, new construction and repair, reconstruction, rehabilitation, or additions to new construction, and substantial improvement of existing buildings and structures, including restoration after damage.

**Proponent’s Reason:** The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.

The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001

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The proposed code change submitted here is a part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

**Committee Action:** 

**Disapproved**

**Committee Reason:** The committee recognizes opposition concerns that International Existing Building Code is not yet complete.

**Assembly Action:** 

**Motion Failed**

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

John Terry, State of New Jersey, representing the International Existing Building Code (IEBC) Drafting Committee, requests Approved As Submitted.

**Commenter’s Reason:** Contrary to the reported reason for Disapproval, the IEBC is, in fact, complete and is undergoing maintenance of provisions in the 2002 Cycle, just like all the I-codes. In recognition of this fact, the IBC General Committee approved code change proposal G133, that replaces the current text of 2000 IBC chapter 34, Existing Structures, with a reference to the IEBC. The IEBC Drafting process was very similar to the process used to develop the IBC - a committee developed a draft(s) which was then exposed to the rigors of the ICC Code Development Process. The 2003 IEBC will be part of the 2003 family of International Codes. The development of the IEBC structural provisions involved the study and use of structural provisions of the IBC with the extensive involvement of many structural engineers experienced in existing building design and structural organizations such as the Structural Engineers Association of California (SEAOC) and the Structural Engineering Institute (SEI) of the American Society of Civil Engineers.

The following is a section-by-section enumeration of provisions found in the IBC, coordinated with the proposed text of the structural provisions of the IEBC. This demonstrates the approach taken by the IEBC which mirrors the requirements of the IBC for additions, change of occupancy, and alterations.

**1614.1.1 Additions:** When an addition is constructed, the existing building must meet the structural provisions of the IBC if the existing building is not independent and if the seismic forces in any structural element of the existing structure are increased, because of the addition, by more than 5% of the design for the existing building. The IEBC includes this same criteria in Section 903.1. This general section requires additions to comply with the IBC and Section 903.3, Exception 3 which does not require compliance with the IBC where the story shear in the existing building is not increased by more than 5 percent. The only difference between the IBC and IEBC is Exception 1 to Section 903.3, which allows a 10 percent story shear increase in buildings of wood frame construction of Group R in recognition of the ability of wood to withstand higher forces and perform elastically over short durations of load.

**1614.2 Change of occupancy:** With the exception for detailing, the IBC generally requires changes of occupancy to a higher seismic group to meet the more restrictive requirement of the higher group. Section 807.3.1 of the IEBC includes this general provision. IEBC Section 807.3.1 Exception 2 includes detailing, and stipulates that buildings
which undergo a change of occupancy to one with a higher “life safety and exit” hazard (IEBC Table 812.4.1), the new occupancy must also comply with the IBC. The IEBC includes more restrictive provisions for Group M changes to Group A, E, I-1, R-1, R-2 and R-4 where 2/3 or more of the floors are being altered. Under the IBC, this would typically be viewed as a change to lower seismic use group not requiring a seismic analysis.

The IEBC does not require full compliance with the IBC where the area of the new occupancy with higher Hazard Category is less than or equal to 10% of the total building floor area and the new occupancy is not classified as seismic use group III or where only one story is affected by the change (IEBC Section 807.3.1, Exceptions 3 and 4, respectively).

1614.3 Alterations: The IBC requires compliance with the new building requirements with the exception of those structural elements whose current stress is not increased by more than 5 percent. Similarly the IEBC requires, Level 1 alterations (the removal and replacement of equipment) and Level 2 alterations (reconfiguration of space) to comply with IBC with the exception of those structural elements whose current stress is not increased by more than 5 percent in accordance with IEBC Section 507.2.1, Exception 2 and Section 607.4.1, Exception 2 respectively. Level 3 alterations (reconfiguration of space where the aggregate area exceeds 50% of the total building area) would require an engineering evaluation and analysis, which demonstrates the structural adequacy of the entire altered structure based on 75% of the IBC load criteria. Even existing portions of buildings that are not part of the alteration and which are not designed to conform to a contemporary code are required to comply with the engineering evaluation provision (IEBC Section 707.5.1).

2308.10.7.3 Truss alterations: The IBC requires that trusses be investigated to ensure that they are capable of supporting the loads if alterations result in additional loads which may impact their load carrying capability. IEBC Sections 507.2.1 and 607.4.1 also require such an analysis, however, the IEBC would allow a 5% overstress in stress is not increased by more than 5 percent in accordance with IEBC Section 507.2.1, Exception 2 and Section 607.4.1, Exception 2 respectively. Level 3 alterations (reconfiguration of space where the aggregate area exceeds 50% of the total building area) would require an engineering evaluation and analysis, which demonstrates the structural adequacy of the entire altered structure based on 75% of the IBC load criteria. Even existing portions of buildings that are not part of the alteration and which are not designed to conform to a contemporary code are required to comply with the engineering evaluation provision (IEBC Section 707.5.1).

G102.1 Flood hazards: The appendix to the IBC, if adopted, includes administrative provisions with respect to flood hazards as well as a reference to ASCE 24-98 for the design of structures in flood zones. Sections 401.4 and 501.3 of the IEBC reinforce the provisions of the IBC by specifically requiring that repairs and alterations comply with the Section 1612 of the IBC which includes a requirement for the certification of compliance with ASCE 24.

The IEBC Drafting Committee respectfully requests the membership approval of this public comment (AS)

S39-02

1616.3

Proposed Change as Submitted:

Propponent: Joseph J. Messersmith, Jr., Portland Cement Association

Revise as follows:

1616.3 Determination of seismic design category. All structures shall be assigned to a seismic design category based on their seismic use group and the design spectral response acceleration coefficients, $S_{DS}$ and $S_{D1}$, determined in accordance with Section 1615.1.3 or 1615.2.5. Each building and structure shall be assigned to the most severe seismic design category in accordance with Table 1616.3(1) or 1616.3(2) irrespective of the fundamental period of vibration of the structure, $T$.

Exception: The seismic design category is permitted to be determined from Table 1616.3(1) when the approximate fundamental period of the structure, $T_{sa}$ in each of the two orthogonal directions determined in accordance with Section 1617.4.2.1 is less than 0.8 $T_s$ determined in accordance with Section 1615.1.4 and equation 16-35 is used to determine the seismic response coefficient, $C_r$.

Proponent’s Reason: This proposal is a resubmission of a proposal submitted for inclusion in the 2002 Supplement, with one important modification. The original submission proposed that the Seismic Design Category be allowed to be determined based on $S_{DS}$ only, provided $T_s < T_{sa}$ and provided that upper-bound design base shear ($V = C_s W$, with $C_s$ given by Equation 16-35) is used in design. In this revised proposal, $T_w$ will have to be less than 0.8 $T_s$ for SDC determination to be based on $S_{DS}$ alone. The upper-bound design base shear will still have to be used in design. This revision addresses discomfort arising out of the fact that $T$ may be greater than $T_{sa}$ even when $T_s < T_{sa}$. When $T_s < 0.8T_{sa}$, $T$ will be less likely to be greater than $T_{sa}$. The strength penalty imposed by the requirement for design for the upper-bound design base shear should compensate for any minor incursions into the velocity-controlled range of the design spectrum (i.e., $T > T_s$).

Presently Section 1616.3 requires that the Seismic Design Category (SDC) of a structure, regardless of its fundamental period, $T$, be based on the more stringent of the two determined based on $S_{DS}$ and $S_{D1}$. This means that many structures designed based on the flat portion of the design response spectrum ($T$ equal to or less than $T_{sa}$ in Figure 1615.1.4) have their Seismic Design Category determined from the value of $S_{D1}$ rather than from $S_{DS}$. To illustrate how this adversely affects the SDC assigned a structure, see the table below. It shows for numerous locations throughout the United States, the SDC for structures based on Site Classes A through E under the current code. The SDCs shown in parenthesis () are the categories that will apply if the proposal is approved (i.e., $T_s$ less than 0.8$T_{sa}$). A review of the table will show that cities where structures are assigned to low and moderate seismic risk (SDC A, B and C) are the ones most adversely affected by the existing provisions.

During the development of the International Residential Code (IRC), it was decided that only the value of $S_{DS}$ would be considered in assigning a structure to a SDC. This decision was based on the fact that the scope of the IRC is limited to residential building no more than 3 stories in height. These structures typically have fundamental periods, $T$, less than $T_{sa}$.

Where the approximate fundamental period, $T_{sa}$, is less than $T_s$, equation 16-35 should be used to determine the seismic response coefficient, $C_r$. The suggested provisions specifically state that equation 16-35 must be used to determine $C_r$ to assure that design will be based on the upper bound, flat portion of the design response spectrum (see Figure 1615.1.4).

To illustrate application of this proposal, consider a building to be erected in Charlotte, NC. The table below shows that a structure sited
on soil classified as Site Classes C and D will be assigned to SDC C and D, respectively. The SDC is determined by the higher of the two, and in both cases is based on the categories determined from \( S_{S1} \).

Under the proposal, short-period buildings with \( T_a \) less than \( 0.8T_s \), the SDC will be allowed to be determined based on \( S_{DS} \), and in the cases of the two site classes shown in the table, the SDC will be reduced to B and C. The last three columns of the table show the heights of buildings with various types of seismic-force resisting systems corresponding to approximate fundamental period, \( T_a \) equal to \( 0.8T_s \). Buildings in Charlotte, North Carolina with heights less than these values will be able to utilize the exception.

| SiteClass | \( S_a \) | \( S_i \) | \( F_a \) | \( F_i \) | \( S_{DS}/SDC \) | \( S_{D1}/SDC \) | \( T_a \) | \( h_n \), based on \( T_a = 0.8T_s \) for various \( C_a \) |
|-----------|---------|---------|---------|---------|----------------|----------------|--------|----------------|----------------|
| C         | 0.35    | 0.145   | 1.20    | 1.66    | 0.28/B         | 0.16/C         | 0.65   | \( T_a = 0.8T_s \) |
| D         | 0.35    | 0.145   | 1.52    | 2.22    | 0.35/C         | 0.21/D         | 0.60   | \( T_a = 0.8T_s \) |

a. \( S_a \) and \( S_i \) estimated from contour maps
b. Steel moment frames
c. Concrete moment frames
d. All others, including shear walls

Seismic Design Category (SDC) according to 2000 IBC
SDC in parenthesis ( ) based on proposal
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* Site-specific geotechnical investigation and dynamic site response analysis must be performed ($S_s \geq 1.25$ or $S_s \geq 0.5$)
Committee Action: Approved as Modified

Modify proposal as follows:

1616.3 Determination of seismic design category. All structures shall be assigned to a seismic design category based on their seismic use group and the design spectral response acceleration coefficients, $S_{DS}$ and $S_{D1}$, determined in accordance with Section 1615.1.3 or 1615.2.5. Each building and structure shall be assigned to the most severe seismic design category in accordance with Table 1616.3(1) or 1616.3(2) irrespective of the fundamental period of vibration of the structure, $T$.

Exception: The seismic design category is permitted to be determined from Table 1616.3(1) alone when all of the following apply:
1. the approximate fundamental period of the structure, $T_a$, in each of the two orthogonal directions determined in accordance with Section 1617.4.2.1 is less than 0.8 $T_s$ determined in accordance with Section 1615.1.4, and
2. equation 16-35 is used to determine the seismic response coefficient, $C_s$, and
3. The diaphragms are rigid as defined in Section 1602.

Committee Reason: The committee supports this proposal since BSSC committee TS-2 has reviewed it and believes it is acceptable. The additional restriction making the exception applicable exclusively to buildings with rigid diaphragms is in response to a concern raised by the BSSC Code Resource Support Committee.

Staff note: If code change S43-02 is ultimately approved, equation and section references will be revised to reflect corresponding ASCE 7 provisions.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tom H. Hale, Structural Engineers Association of Central California; representing SEAOC Seismology Committee, requests Disapproved.

Commenter’s Reason: This proposal permits the use of $S_{DS}$ only to determine the SDC for stiff buildings. In effect, the period calculated for the building determines what spectral acceleration map, 0.2 second or 1.0 second, will be used. Since building period determination compared to the actual building response is highly problematic and can be too low for stiff buildings where rocking is predominant, the proposed methodology will be unconservative when used to determine the Seismic Design Category for stiff buildings.

The proposed methodology was previously considered and rejected when it was developed in the NEHRP process in 1997. This proposal has not completed the NEHRP process and BSSC member organizations have not voted on it.

Reduction in the SDC as a result of this proposal reduces the extent of structural inspection. Lessons from recent earthquakes in the US and around the world point out clearly that the most important factor in assuring good seismic performance of building structures is structural inspections. In addition, the non-structural components, which have fragilities greater than the seismic force resisting system, will either be designed for less force or will have no earthquake requirements at all.

This proposal will also result in increased use of limited ductile seismic force resisting systems and non-ductile members not part of the seismic force resisting system in soil site classes C and D.

S40-02

1616.5

Proposed Change as Submitted:

Proponent: James A. Rossberg (SEI of ASCE); representing Structural Engineering Institute of ASCE and David R. Bonneville (NCSEA); representing NCSEA Seismic Committee

1. Revise as follows:

1616.5 Building configuration. Buildings shall be classified as regular or irregular based on the criteria in Section 9.5.2.3 of ASCE 7. Such classification shall be based on the plan and vertical configuration.

2. Delete without substitution:

1616.5.1 Plan irregularity. Buildings having one or more of the features listed in Table 1616.5.1 shall be designated as having plan structural irregularity and shall comply with the requirements in the sections referenced in Table 1616.5.2.

1616.5.2 Vertical irregularity. Buildings having one or more of the features listed in Table 1616.5.2 shall be designated as having vertical irregularity and shall comply with the requirements in the sections referenced in Table 1616.5.2.

Exceptions:

1. Structural irregularities of Type 1a, 1b or 2 in Table 1616.5.2 do not apply where no story drift ratio under design lateral load is greater than 130 percent of the story drift ratio of the next story above. Torsional effects need not be considered in the calculation of story drifts for the purpose of this determination. The story drift ratio relationship for the top two stories of the buildings are not required to be evaluated.

2. Irregularities Types 1a, 1b and 2 of Table 1616.5.2 are not required to be considered for one-story buildings in any seismic design category or for two-story buildings in Seismic Design Category A, B, C or D.
Proponent’s Reason: The building configuration provisions of ASCE 7-02 are very similar to those of the IBC. This proposed partial adoption of ASCE 7-02:

Responds to requests from ICC Committees to remove complex technical provisions from the code in favor of simple references to consensus standards containing the same provisions.
Shortens the length of the IBC seismic design provisions.
Encourages technical code changes to go through a national consensus process.
Sparcs practitioners slightly different versions of essentially the same requirements in multiple documents.
Still leaves basic scoping requirements in the building code.
Increases overall efficiency in progressive development of technical provisions and avoids redundant and duplicate efforts.

Committee Action: Approved as Modified

Modify item 2 of proposal as follows:
Delete Tables 1616.5.1 & 1616.5.2.

Item 1 approved as proposed

Committee Reason: Based on proponent’s published reason. The modification clarifies that tables are to be deleted as well as the text.

Staff Note: If the final version of ASCE 7-02 is not readily available and received for staff review by the deadline for receiving public comments, S40-02 will be placed on the Final Action Individual Consideration Agenda.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:
James M. Delahay, Chairman, IBC Structural Committee requests Approved as Modified by this comment.

Modify item 1 of proposal as follows:

1616.5 Building configuration. Buildings shall be classified as regular or irregular based on the criteria in Section 9.5.2.3 of ASCE 7, except that buildings designed using the simplified analysis procedure in Section 1617.5 shall be classified based on the provisions in Sections 1616.5.1.

1616.5.1 Building configuration (for use in Simplified Analysis Procedure 1617.5). Buildings designed using the simplified analysis procedure in Section 1617.5 shall be classified as regular or irregular based on the criteria in this section. Such classification shall be based on the plan and vertical configuration.

Modify item 2 of proposal as follows:

1616.5.1.1 Plan irregularity. Buildings having one or more of the features listed in Table 1616.5.1 shall be designated as having plan structural irregularity and shall comply with the requirements in the sections referenced in Table 1616.5.1.1.

1616.5.2 Vertical irregularity. Buildings having one or more of the features listed in Table 1616.5.2 shall be designated as having vertical irregularity and shall comply with the requirements in the sections referenced in Table 1616.5.1.2.

Exceptions:
1. Structural irregularities of Type 1a, 1b or 2 in Table 1616.5.1.2 do not apply where no story drift ratio under design lateral load is greater than 130 percent of the story drift ratio of the next story above. Torsional effects need not be considered in the calculation of story drifts for the purpose of this determination. The story drift ratio relationship for the top two stories of the buildings are not required to be evaluated.
2. Irregularities Types 1a, 1b and 2 of Table 1616.5.1.2 are not required to be considered for one-story buildings in any seismic design category or for two-story buildings in Seismic Design Category A, B, C or D.

Retain and renumber Table 1616.5.1 to 1616.5.1.1.

Retain and renumber Table 1616.5.2 to 1616.5.1.2.

Commenter’s Reason: This code change was part of a package of seismic proposals from NCSEA/SEI that removed the bulk of the seismic provisions and adopted the ASCE 7-02 seismic provisions by reference. During the Structural Committee’s deliberations on that package, the committee decided that it preferred to leave the simplified analysis procedure in Section 1617.5 in the IBC itself, instead of removing it as was proposed. It was clear to me that the committee’s intent was to have a method in the IBC that would not require the use of ASCE 7 for certain smaller buildings. Code changes S41-02 and S43-02 were modified and approved leaving Section 1617.5 in place. However, in the haste of the hearing process, the committee did not modify other code changes in the package to leave in provisions necessary to use the simplified procedure without requiring users to go to ASCE 7. Such items include the R-factor, seismic load effect E, detailing requirements, and drift limits.

As IBC Structural Committee Chairman, I feel it is my responsibility to assure the intent of the committee is followed. I therefore propose these modifications to restore the required items to Chapter 16, allowing the simplified procedure to be used as a stand alone method.

Public Comment 2:
David S. Collins, FAIA, The PREVIEW Group, Inc; representing The American Institute of Architects, requests Disapproved.

Commenter’s Reason: S40 I believe is a disservice to the architects, engineers and building code officials as it removes the definitions of irregularity of plan or verticality (section) form quick access in the ICC code. One would have to go to and have ASCE 7 even to find out if a given building had such a characteristic. The basic tools to communicate among professionals is lost.

We agree that standards should be created and developed by the appropriate expert agencies and referenced in the code where it is beneficial to do so. In this situation however, basic tools are being removed from the users of the code that can help determine how and when the standard will be applied. Such basic criteria should remain in the code. Designers can use information such as re-entrant corners, diaphragm discontinuity, or out-of-plane offsets to make decisions in a preliminary way without necessarily delving into the entire ramifications of the ASCE standard, and still providing them with sufficient understanding to make rational decisions. If there are changes necessary to coordinate the code with the standard, such changes should be made.
S41-02
1616.6

Proposed Change as Submitted:

Proponent: James A. Rossberg (SEI of ASCE); representing Structural Engineering Institute of ASCE and David R. Bonneville (NCSEA); representing NCSEA Seismic Committee

1. Revise as follows:

1616.6 Analysis procedures: A structural analysis shall be made for all structures in accordance with the requirements of this section. A structural analysis conforming to one of the types permitted in Section 9.5.2.5.1 of ASCE 7 shall be made for all structures. The analysis shall form the basis for determining the seismic forces $E$ and $E_M$, to be applied in the load combinations of Section 1605 and also shall form the basis for determining the design drift as required by Section 1617.3 of ASCE 7. Sections 9.5.2.8 of ASCE 7.

Exceptions:

1. Structures assigned to Seismic Design Categories A.
2. Design drift need not be evaluated in accordance with Section 1617.3 when the simplified analysis method of Section 1617.5 is used. For structures designed using the index force analysis procedure of Section 9.5.4 or the simplified analysis procedure of Section 9.5.3 or the simplified analysis procedure of Section 9.5.4 of ASCE 7, drift need not be evaluated.

2. Delete without substitution.

Section 1616.6.1 Simplified analysis: A simplified analysis, in accordance with Section 1617.5 shall be permitted to be used for any structure in Seismic Use Group I, subject to the following limitations, or a more rigorous analysis shall be made:

2. Buildings of any construction other than light framed construction, not exceeding two stories in height, excluding basements, with flexible diaphragms at every level as defined in Section 1602.

Section 1616.6.2 Seismic Design Categories B and C: Except as permitted by Section 1616.6, the analysis procedures in Section 1617.4 shall be used for structures assigned to Seismic Design Category B or C (Section 1616) or a more rigorous analysis is permitted to be made.

Section 1616.6.3 Seismic Design Categories D, E and F: The analysis procedures identified in Table 1616.6.3 shall be used for structures assigned to Seismic Design Category D, E or F (see Section 1616), or a more rigorous analysis shall be made. For regular structures five stories or fewer in height having a period T, as determined in Section 1617.4.2, of 0.5 seconds or less, the design spectral response accelerations $S_0$ and $S_1$, need not exceed the values calculated using values of $S_0$ and $S_1$, respectively, of 1.5g and 0.6g.

For the purposes of this section, structures shall be considered regular if they do not have plan irregularities 1a, 1b or 4 of Table 1616.5.1 or vertical irregularities 1a, 1b, 4 or 5 of Table 1616.5.2.

Proponent’s Reason: The requirements concerning analytical procedures of ASCE 7-02 are very similar to those of the IBC and in many ways are better organized. This proposed partial adoption of ASCE 7-02:

- Responds to requests from ICC Committees to remove complex technical provisions from the code in favor of simple references to consensus standards containing the same provisions.
- Shortens the length of the IBC seismic design provisions.
- Encourages technical code changes to go through a national consensus process.
- Spires practitioners slightly different versions of essentially the same requirements in multiple documents.
- Still leaves basic scoping requirements in the building code.
- Increases overall efficiency in progressive development of technical provisions and avoids redundant duplicate efforts.

The proposal changes an IBC requirement for model analysis using site-specific response spectra, but it is consistent with the 2000 NEHRP.

Analysis: Consideration should be given to retaining provisions for simplified analysis in Section 1616.6.1, in a manner similar to the simplified wind procedure of Section 1609.6.

To use the simplified earthquake analysis procedure the following sections would also need to be retained (or references provided to the appropriate sections of ASCE 7-02), Section 1617.5, the simplified method. Sections 1617.6 thru 1617.6.3.2 and Table 1617.6......regarding the Response Modification Coefficient and the criteria for its value selection. Sections 1617.1 thru 1617.2.....regarding the determination of the total seismic load effect $E$ for the load combinations. Section 1620......regarding structural system detailing requirements which would still apply. Sections 1617.3 and 1620.3..6......regarding the drift limits.

Committee Action: Approved as Modified

Modify item 2 of proposal as follows:

Section 1616.6.1 Simplified analysis. A simplified analysis, in accordance with Section 1617.5 shall be permitted to be used for any structure in Seismic Use Group I, subject to the following limitations, or a more rigorous analysis shall be made:

2. Buildings of any construction other than light framed construction, not exceeding two stories in height, excluding basements, with flexible diaphragms at every level as defined in Section 1602.

2. Buildings of any construction other than light framed construction, not exceeding two stories in height, excluding basements, with flexible diaphragms at every level as defined in Section 1602.

Delete Table 1616.6.3.

Item 1 approved as proposed

Committee Reason: Based on proponent’s published reason. The committee modified the proposal to retain the simplified analysis in the IBC. Another modification was made to clarify that Table 1616.6.3 is to be deleted as well as the code text.

Staff note: The committee modification retaining Section 1616.6.1 Simplified analysis is consistent with the action taken S43-02. The committee did not attempt to modify the exception to 1616.6 in item 1 of this proposal. The exception currently references the IBC simplified analysis procedure, but the code change, as approved, changes this to the simplified procedure of ASCE 7. For consistency further modification may be in order. Also see staff note in code change S43-02.

If the final version of ASCE 7-02 is not readily available and received for staff review by the deadline for receiving public comments, S41-02 will be placed on the Final Action Individual Consideration Agenda.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

James M. Delahay, Chairman, IBC Structural Committee requests Approved as Modified by this comment.

Modify item 1 of proposal as follows:

1616.6 Analysis procedures: A structural analysis conforming to one of the types permitted in Section 9.5.2.5.1 of ASCE 7 or to the simplified analysis procedure in Section 1617.5 shall be made for all structures. The analysis shall form the basis for determining the seismic forces \( E \) and \( E_m \) to be applied in the load combinations of Section 1605 and also shall form the basis for determining the design drift as required by Section 9.5.2.8 of ASCE 7 or Section 1617.3.

Exceptions:

1. Structures assigned to Seismic Design Category A.
2. For structures designed using the index force analysis procedure of Section 9.5.3 or the simplified analysis procedure of Section 9.6.4 of ASCE 7 or using the simplified analysis procedure in Section 1617.5, drift need not be evaluated.

Item 2 as previously approved.

Commenter’s reason: This code change was part of a package of seismic proposals from NCSEA/SEI that removed the bulk of the seismic provisions and adopted the ASCE 7-02 seismic provisions by reference. During the Structural Committee’s deliberations on that package, the committee decided that it preferred to leave the simplified analysis procedure in Section 1617.5 in the IBC itself, instead of removing it as was proposed. It was clear to me that the committee’s intent was to have a method in the IBC that would not require the use of ASCE 7 for certain smaller buildings. Code changes S41-02 and S43-02 were modified and approved leaving Section 1617.5 in place. However, in the haste of the hearing process, the committee did not modify other code changes in the package to leave in provisions necessary to use the simplified procedure without requiring users to go to ASCE 7. Such items include the R-factor, seismic load effect \( E \), detailing requirements, and drift limits.

Exception 1 to Section 1616.6 is retained since none of the ASCE proposals deleted Section 1616.4 of the IBC which covers seismic design category A. For the same reason, the reference to ASCE 7 Section 9.5.3 should be deleted since IBC Section 1616.4 will be used.

As IBC Structural Committee Chairman, I feel it is my responsibility to assure the intent of the committee is followed. I therefore propose these modifications to restore the required items to Chapter 16, allowing the simplified procedure to be used as a stand alone method.

---

S43-02

1617

Proposed Change as Submitted:

Proponent: James A. Rossberg (SEI of ASCE); representing Structural Engineering Institute of ASCE and David R. Bonneville (NCSEA); representing NCSEA Seismic Committee

1. Revise as follows:

1617.1 Seismic load effect \( E \) and \( E_m \). Seismic load effect \( E \) and \( E_m \) for use in the load combinations of Section 1605 shall be determined as follows: The seismic load effect \( E \) for use in the basic load combinations of Sections 1605.2 and 1605.3 shall be determined from Section 9.5.2.7 of ASCE 7. The maximum seismic load effect \( E_m \) for use in the special seismic load combination of Section 1605.4 shall be the special seismic load determined from Section 9.5.2.7.1 of ASCE 7.

2. Delete without substitution:

1617.1.1 Seismic load effect \( E \). Where the effects of gravity and the seismic ground motion are additive, seismic load, \( E \), for use in Formulas 16-5, 16-10, and 16-17 shall be defined by Equation 16-28:

\[
E = Q_m + 0.2S_{uw}D \quad \text{(Equation 16-28)}
\]

where:

\( D \) = The effect of dead load.
\( E \) = The combined effect of horizontal and vertical earthquake induced forces.
Where the effects of gravity and seismic ground motion counteract, the seismic load, $E$, for use in Formulas 16-6; 16-12 and 16-18 shall be defined by Equation 16-29:

$$E = Q_{E} - 0.2S_{DS}D \quad \text{(Equation 16-29)}$$

Design shall use the load combinations prescribed in Section 1605.2 for strength or load and resistance factor design methodologies, or Section 1605.3 for allowable stress design methods.

1617.1.2 Maximum Seismic Load Effect, $E_m$. The maximum seismic load effect, $E_m$, shall be used in the special seismic load combinations in Section 1605.4.

Where the effects of the seismic ground motion and gravity loads are additive, seismic load, $E_m$, for use in Formula 16-19 shall be defined by Equation 16-30:

$$E_m = -Q_{E} + 0.2S_{DS}D \quad \text{(Equation 16-30)}$$

Where the effects of the seismic ground and gravity loads counteract, seismic load, $E_m$, for use in Formula 16-20 shall be defined by Equation 16-31:

$$E_m = -Q_{E} - 0.2S_{DS}D \quad \text{(Equation 16-31)}$$

where $E$, $Q_{E}$, $S_{DS}$ are as defined above and $r_{max}$ is the system overstrength factor as given in Table 1617.6.

The term $-Q_{E}$ need not exceed the maximum force that can be transferred to the element by the other elements of the lateral-force-resisting system.

Where allowable stress design methodologies are used with the special load combinations of Section 1605.4, design strengths are permitted to be determined using an allowable stress increase of 1.7 and a resistance factor, $r_{max}$, of 1.0. This increase shall not be combined with increases in allowable stresses or load combination reductions otherwise permitted by this code or the material reference standard except that combination with the duration of load increases permitted in Chapter 23 is permitted.

3. Delete and substitute as follows:

1617.2 Redundancy. A redundancy coefficient, $r_{max}$, shall be assigned to all structures in accordance with this section, based on the extent of structural redundancy inherent in the lateral-force-resisting system.

1617.2 Redundancy. The provisions given in Section 9.5.2.4 of ASCE 7 shall be used.

4. Delete without substitution:

1617.2.1 Seismic Design Category A, B or C. For structures assigned to Seismic Design Category A, B or C (see Section 1616), the value of the redundancy coefficient is 1.0.

1617.2.2 (Supp) Seismic Design Categories D, E and F. For structures in Seismic Design Categories D, E and F (see Section 1616), the redundancy coefficient, $r_{max}$, shall be taken as the largest of the values of $r_{max}$ calculated at each story of the structure in accordance with Equation 16-32 as follows:

$$r_{max} = \frac{V_{D}}{V_{T}}$$

where:

- $V_{D}$ = The ratio of the design story shear resisted by the most heavily loaded single element in the story to the total story shear, for a given direction of loading.

- For braced frames, the value of $r_{max}$ is equal to the lateral force component in the most heavily loaded brace element divided by the story shear.

- For moment frames, $r_{max}$ shall be taken as the maximum of the sum of the shears in any two adjacent columns in a moment frame divided by the story shear. For columns common to two bays with moment-resisting connections on opposite sides at the level under consideration, it is permitted to use 70 percent of the shear in that column in the column shear summation.

- For shear walls, $r_{max}$ shall be taken as the maximum value of the product of the shear in the wall or wall pier and $10/l_w/(3.3/l_w$ for SI), divided by the story shear, where $l_w$ is the length of the wall or wall pier in feet (m).

In light-frame construction the value of the...
ratio of $10/\omega$ need not to be greater than 1.6.

For dual systems, $r_{\text{max}}$ shall be taken as the maximum value defined above, considering all lateral load-resisting elements in the story. The lateral loads shall be distributed to elements based on relative rigidities considering the interaction of the dual system. For dual systems, the value of $\rho$ need not exceed 80 percent of the value calculated above.

$A_f = \text{the floor area in square feet (m}^2\text{) of the diaphragm level immediately above the story.}$

The value, $A_f$, shall not be less than 1.0, and need not exceed 1.5.

For structures with seismic-force-resisting systems in any direction comprised solely of special moment frames, the seismic force resisting system shall be configured such that the value of $\rho_{Lu}$ calculated in accordance with this section does not exceed 1.25 for structures assigned to Seismic Design Category D, and does not exceed 1.1 for structures assigned to Seismic Design Category E or F.

For structures with vertical combinations of seismic-force-resisting systems, the value, $\rho$, shall be determined independently for each seismic-force-resisting system. The reliability/redundancy factor of the lower portion shall not be less than the following:

$$\rho_L = \frac{R_L \rho_u}{R_u}$$

(Equation 16-33)

where:

$\rho_L = \text{of lower portion.}$

$R_L = \text{R of lower portion.}$

$\rho_u = \text{of upper portion.}$

$R_u = \text{R of upper portion.}$

5. Delete and substitute as follows:

1617.3 Deflection and drift limits. The design story drift, $\delta$, as determined in Section 1617.4.6 or Section 1617.5.3, shall not exceed the allowable story drift, $\delta_{\text{max}}$, as obtained from Table 1617.3 for any story. All portions of the building shall be designed to act as an integral unit in resisting seismic forces unless separated structurally by a distance sufficient to avoid damaging contact under total deflection, $\delta$, as determined in Section 1617.4.6.1.

1617.3 Deflection and drift limits. The provisions given in Section 9.5.2.8 of ASCE 7 shall be used.

6. Delete and substitute as follows:

1617.4 Equivalent lateral force procedure for seismic design of building. See Section 1616.6 for limitations on the use of this procedure. For purposes of this analysis procedure, a building is considered to be fixed at the base.

1617.4 Equivalent lateral force procedure for seismic design of building. The provisions given in Section 9.5.5 of ASCE 7 shall be used.

7. Delete without substitution:

Section 1617.4.1 Seismic base shear through Section 1617.4.6.2 P-delta effects (remainder of current Section 1617.4)

8. Delete and substitute as follows:

1617.5 Simplified analysis procedures for seismic design of buildings. See Section 1616.6 for limitations on the use of this procedure. For purposes of this analysis procedure, a building is considered to be fixed at the base.

1617.5 Simplified analysis procedures for seismic design of buildings. The provisions given in Section 9.5.4 of ASCE 7 shall be used.

9. Delete without substitution:

Section 1617.5.1 Seismic base shear. The seismic base shear, $V$, in a given direction shall be determined in accordance with the following equation:

$$V = \frac{1.2 S_{\text{DS}} W}{R}$$

(Equation 16-49)

where:

$S_{\text{DS}} = \text{The design elastic response acceleration at short period as determined in accordance with Section 1615.1.3.}$

$R = \text{The response modification factor from Table 1617.6.}$

$W = \text{The effective seismic weight of the structure, including the total dead load and other loads listed below:}$

1. In areas used for storage, a minimum of 25 percent of the reduced floor live load (floor live load in public garages and open parking structures need not be included).

2. Where an allowance for partition load is included in the floor load design, the actual partition weight or a minimum weight of 10 pounds per square foot of floor area, whichever is greater (0.48kN/m$^2$).

3. Total weight of permanent operating equipment.

4. 20 percent of flat roof snow load where flat snow load exceeds 30 pounds per square foot (1.44 kN/m$^2$).
Section 1617.5.2 Vertical distribution. The forces at each level shall be calculated using the following equation:

\[ F_s = \frac{1.2 S_{ds}}{R} w_x \]  
(Equation 16-50)

where:
- \( w_x \) = The portion of the effective seismic weight of the structure, \( W \), at Level \( x \).

1617.5.3 (Supp) Horizontal distribution. Diaphragms constructed of untopped steel decking or wood structural panels or similar light-frame construction are permitted to be considered as flexible.

Section 1617.5.4 Design drift. For the purposes of Section 1617.3 and Section 1620.3.6 the design story drift, \( \delta \), shall be taken as 1 percent of the story height unless a more exact analysis is provided.

10. Delete and substitute as follows:

1617.6 Seismic-force-resisting systems. The basic lateral and vertical seismic-force-resisting systems shall conform to one of the types indicated in Table 1617.6 subject to the limitations on height indicated in the table based on seismic design category as determined in Section 1616. The appropriate response modification coefficient, \( R \), system overstrength factor, \( \phi \), and deflection amplification factor, \( C_d \), indicated in Table 1617.6 shall be used in determining the base shear, element design forces and design story drift.

For seismic-force-resisting systems not listed in Table 1617.6, analytical and test data shall be submitted that establish the dynamic characteristics and demonstrate the lateral force resistance and energy dissipation capacity to be equivalent to the structural systems listed in Table 1617.6 for equivalent response modification coefficient, \( R \), system overstrength coefficient, \( \phi \), and deflection amplification factor, \( C_d \), values.

--- Exception: Structures assigned to Seismic Design Category A.

11. Delete without substitution:

Section 1617.6.1 Dual Systems through Section 1617.6.4.4 Special Moment Frames (the remainder of current Section 1617.6).

12. Delete Table 1617.6 and substitute the following:
## TABLE 1617.6
DESIGN COEFFICIENTS AND FACTORS FOR BASIC SEISMIC-FORCE-RESISTING SYSTEMS

<table>
<thead>
<tr>
<th>BASIC SEISMIC-FORCE-RESISTING SYSTEM</th>
<th>RESPONSE MODIFICATION COEFFICIENT, R</th>
<th>SYSTEM OVER-STRENGTH FACTOR, ( \gamma )</th>
<th>DEFLECTION AMPLIFICATION FACTOR, ( C_D )</th>
<th>SYSTEM LIMITATIONS AND BUILDING HEIGHT LIMITATIONS (FT) BY SEISMIC DESIGN CATEGORY AS DETERMINED IN SECTION 1616.3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A &amp; B C D E F</td>
</tr>
<tr>
<td>1. Bearing Wall Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordinary plain prestressed masonry shears</td>
<td>1 1/2</td>
<td>2 1/2</td>
<td>1 1/4</td>
<td>NL</td>
</tr>
<tr>
<td>Intermediate prestressed masonry shears</td>
<td>3 1/2</td>
<td>2 1/2</td>
<td>3</td>
<td>NL</td>
</tr>
<tr>
<td>Special prestressed masonry shears</td>
<td>5 1/2</td>
<td>2 1/2</td>
<td>3 1/2</td>
<td>NL</td>
</tr>
<tr>
<td>2. Building Frame Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordinary plain prestressed masonry shears</td>
<td>1 1/2</td>
<td>2 1/2</td>
<td>1 1/4</td>
<td>NL</td>
</tr>
<tr>
<td>Intermediate prestressed masonry shears</td>
<td>4</td>
<td>2 1/2</td>
<td>4</td>
<td>NL</td>
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<tr>
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<td>5 1/2</td>
<td>2 1/2</td>
<td>4</td>
<td>NL</td>
</tr>
</tbody>
</table>

**Proponent’s Reason:** This code change proposes replacement of certain IBC seismic design provisions in favor of references to corresponding sections of ASCE 7-02 *Minimum Design Loads for Buildings and Other Structures*. Any existing differences between the IBC provisions and the corresponding ASCE 7-02 provisions they are proposed to be replaced by will have been removed if a number of proposed revisions in ASCE 7-02 and a number of code changes submitted for incorporation in IBC-2003 are approved. Structural systems involving prestressed masonry shear walls, which are included in the IBC, but not in the ASCE 7-02, are being added to Table 9.5.2.2 through this proposal. The proposed partial adoption of ASCE 7-02:

- Responds to requests from ICC Committees to remove complex technical provisions from the code in favor of simple references to consensus standards containing the same provisions.
- Shortens the length of the IBC seismic design provisions.
- Encourages technical code changes to go through a national consensus process.
- Spares practitioners slightly different versions of essentially the same requirements in multiple documents.
- Still leaves basic scoping requirements in the building code.
- Increases overall efficiency in progressive development of technical provisions and avoids redundant and duplicate efforts.

**Analysis:** Consideration should be given to retaining the simplified analysis procedure of Section 1617.5 in a manner similar to the simplified provisions for wind.

To use the simplified earthquake analysis procedure the following sections would also need to be retained (or references provided to the appropriate sections of ASCE 7-02), Section 1617.5, the simplified method. Sections 1617.6 thru 1617.6.3.2 and Table 1617.6....regarding the Response Modification Coefficient and the criteria for its value selection. Sections 1617.1 thru 1617.2.....regarding the determination of the total seismic load effect E for the load combinations. Section 1620.....regarding structural system detailing requirements which would still apply. Sections 1617.3 and 1620.3.6.....regarding the drift limits.

**Committee Action:** Approved as Modified

Modify Item 3 of proposal as follows:

1617.2 Redundancy. The provisions given in Section 9.5.2.4 of ASCE 7 shall be used.

**Section 1617.2.1 ASCE 7 Section 9.5.2.4.2.** Modify section 9.5.2.4.2 as follows:

9.5.2.4.2 Seismic Design Category D: For structures in Seismic Design Category D, \( x \) shall be taken as the largest of the values of \( x \) calculated at each story “x” of the structure in accordance with equation 9.5.2.4.2-1 as follows:

\[
\gamma = \frac{20}{r_{max} \sqrt{A_x}} 
\]

(9.5.4.2-1)

where:

- \( r_{max} \) = The ratio of the design story shear resisted by the single element carrying the most shear force in the story to the total story shear, for a given direction of loading. For braced frames, the value of \( r \) is equal to the lateral force component in the most heavily loaded brace element divided by the story shear. For moment frames, \( r \) shall be taken as the maximum of the sum of the shears in any two adjacent columns in the plane of a moment frame divided by the story shear. For columns common to two bays with moment-resisting connections on opposite sides at the level under consideration, 70 percent of the shear in that
column may be used in the column shear summation. For shear walls, \( r_w \) shall be taken equal to shear in the most heavily loaded wall or wall pier multiplied by 10/\( l_w \) (the metric coefficient is 3.3/\( l_w \)) divided by the story shear, where \( l_w \) is the wall or wall pier length in feet (m). The value of the ratio of 10/\( l_w \) need not be greater than 1.0 for buildings of light-frame construction. For dual systems, \( r_w \) shall be taken as the maximum value defined above, considering all lateral-load-resisting elements in the story. The lateral loads shall be distributed to elements based on relative rigidities considering the interaction of the dual system. For dual systems, the value of \( r_w \) need not exceed 80 percent of the value calculated above.

\[ A_x = \text{the floor area in square feet of the diaphragm level immediately above the story.} \]

The value of \( A_x \) need not exceed 1.5, which may be used for any structure. The value of \( A_x \) shall not be taken as less than 1.0.

**Exception:** For structures with seismic-force-resisting systems in any direction comprised solely of special moment frames, the seismic-force-resisting system shall be configured such that the value of \( A_x \) calculated in accordance with this section does not exceed 1.25.

The metric equivalent of Eq. 9.5.2.4.2-1 is:

\[ r_{w,x} = \sqrt{\frac{b_x^2}{r_{\text{max},x}}}. \]

Where \( A_x \) is in square meters.

For structures with vertical combinations of seismic-force-resisting systems, the value of \( A_x \) shall be determined independently for each seismic-force-resisting system. The reliability/redundancy factor of the lower portion shall not be less than the following:

\[ p_l = \frac{R_L p_u}{R_u} \]

where:

\( p_l \) = of lower portion,
\( p_u \) = of upper portion.
\( R_L \) = R of lower portion,
\( R_u \) = R of upper portion.

**Modify item 8 of proposal as follows:**

**1617.5 Simplified analysis procedures for seismic design of buildings.** See Section 1616.6 for limitations on the use of this procedure. For purposes of this analysis procedure, a building is considered to be fixed at the base.

**1617.5 Simplified analysis procedures for seismic design of buildings.** The provisions given in Section 9.5.4 of ASCE 7 shall be used.

**Modify item 9 of proposal as follows:**

**Section 1617.5.1 Seismic base shear.** The seismic base shear, V, in a given direction shall be determined in accordance with the following equation:

\[ V = \frac{1.2 S_d W}{R} \quad \text{(Equation 16-49)} \]

where:

\( S_{DL} \) = The design elastic response acceleration at short period as determined in accordance with Section 1615.1.3.
\( R \) = The response modification factor from Table 1617.6.
\( W \) = The effective seismic weight of the structure, including the total dead load and other loads listed below:

1. In areas used for storage, a minimum of 25 percent of the reduced floor live load (floor live load in public garages and open parking structures need not be included).
2. Where an allowance for partition load is included in the floor load design, the actual partition weight or a minimum weight of 10 pounds per square foot of floor area, whichever is greater (0.48kN/m²).
3. Total weight of permanent operating equipment.
4. 20 percent of flat roof snow load where flat snow load exceeds 30 pounds per square foot (1.44 kN/m²).

**Section 1617.5.2 Vertical distribution.** The forces at each level shall be calculated using the following equation:

\[ F_x = \frac{1.2 S_d W}{R} \quad \text{(Equation 16-50)} \]

where:

\( w_x \) = The portion of the effective seismic weight of the structure, W, at Level \( x \).

1617.5.3 (Supp) Horizontal distribution. Diaphragms constructed of untopped steel decking or wood structural panels or similar light-frame construction are permitted to be considered as flexible.

**Section 1617.5.4 Design drift.** For the purposes of Section 1617.3 and Section 1620.3.6 the design story drift, \( \Delta_x \), shall be taken as 1 percent of the story height unless a more exact analysis is provided.

**Items 1 through 7 & items 10 through 12 approved as proposed**

**Add additional item 13 as follows:**

Delete Tables 1617.3 & 1617.4.2.

**Committee Reason:** Based on proponent’s published reason. The modification to item 3 retains an IBC provision which is not in ASCE 7. The modification to items 8 & 9 retain the simplified analysis procedure in the IBC. The added modification clarifies that the Tables are deleted as well as the text.

**Staff note:** The committee modification retaining the Simplified analysis provision is consistent with the action taken S41-02. The staff analysis in the code change monograph alluded to the fact that the simplified analysis provisions are not “stand alone” provisions. As modified by the committee, code changes S41-02 and S43-02 retain simplified analysis provisions in the IBC which will require the use of ASCE 7 in order to completely carry out the simplified analysis. A portion of the previous staff analysis is reprinted below.

To use the simplified earthquake analysis procedure the following sections would also need to be retained (or references provided to the appropriate sections of ASCE 7-02): Section 1617.5, the simplified method. Sections 1617.6 through 1617.6.3.2 and Table 1617.6... regarding the Response Modification Coefficient and the criteria for its value selection. Sections 1617.1 through 1617.2... regarding the determination of the total seismic load effect E for the load combinations, Section 1620..... regarding structural system detailing requirements which would still apply. Sections 1617.3 and 1620.3.6... regarding the drift limits.

Item 12 deletes the current IBC Table 1617.6 in favor of a reference to the corresponding table in ASCE 7 which does not provide a column for
detailing section references. If these references are desired in the IBC, further modification of this proposal may be in order.

In item 3, Section 1617.2.1 is the phrase “may be used” (for columns common to two bays under the definition of \( r_{max} \)) the desired language or is further modification necessary?

If the final version of ASCE 7-02 is not readily available and received for staff review by the deadline for receiving public comments, S43-02 will be placed on the Final Action Individual Consideration Agenda.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

James M. Delahay, Chairman, IBC Structural committee, requests Approved as Modified by this comment.

Modify item 1 of proposal as follows:

1617.1 Seismic load effect \( E \) and \( E_m \). The seismic load effect \( E \) for use in the basic load combinations of Sections 1605.2 and 1605.3 shall be determined from Section 9.5.2.7 of ASCE 7. The maximum seismic load effect \( E_m \) for use in the special seismic load combination of Section 1605.4 shall be the special seismic load determined from Section 9.5.2.7.1 of ASCE 7.

**Exception:** For structures designed using the simplified analysis procedure in Section 1617.5, the seismic load effect \( E \) and \( E_m \) shall be determined from Section 1617.1.1.

Modify item 2 of proposal as follows:

1617.1.1 Seismic load effect \( E \) and \( E_m \) (for use in Simplified Analysis Procedure 1617.5). Seismic load effect \( E \) and \( E_m \) for use in the load combinations of Section 1605 for structures designed using the simplified analysis procedure in Section 1617.5 shall be determined as follows.

1617.1.1.1 Seismic load effect \( E \). Where the effects of gravity and the seismic ground motion are additive, seismic load, \( E \), for use in Formulas 16-6, 16-12 and 16-18 shall be defined by Equation 16-28:

\[
E = Q_o + 0.2S_{0g}D \quad \text{(Equation 16-28)}
\]

where:

- \( D \) = The effect of dead load.
- \( E \) = The combined effect of horizontal and vertical earthquake-induced forces.
- \( Q_o \) = A reliability factor based on system redundancy obtained in accordance with Section 1617.2.
- \( S_{0g} \) = The design spectral response acceleration at short periods obtained from Section 1615.1.3 or 1615.2.5.

Where the effects of gravity and seismic ground motion counteract, the seismic load, \( E \), for use in Formulas 16-6, 16-12 and 16-18 shall be defined by Equation 16-29:

\[
E = Q_o - 0.2S_{0g}D \quad \text{(Equation 16-29)}
\]

Design shall use the load combinations prescribed in Section 1605.2 for strength or load and resistance factor design methodologies, or Section 1605.3 for allowable stress design methods.

1617.1.1.2 Maximum seismic load effect, \( E_m \). The maximum seismic load effect, \( E_m \), shall be used in the special seismic load combinations in Section 1605.4.

Where the effects of the seismic ground motion and gravity loads are additive, seismic load, \( E_m \), for use in Formula 16-19 shall be defined by Equation 16-30:

\[
E_m = Q_o + 0.2S_{0g}D \quad \text{(Equation 16-30)}
\]

Where the effects of the seismic ground and gravity loads counteract, seismic load, \( E_m \), for use in Formula 16-20 shall be defined by Equation 16-31:

\[
E_m = Q_o - 0.2S_{0g}D \quad \text{(Equation 16-31)}
\]

where \( Q_o \), \( S_{0g} \) are as defined above and \( Q_o \) is the system overstrength factor as given in Table 1617.6.

The term \( Q_o \), need not exceed the maximum force that can be transferred to the element by the other elements of the lateral-force-resisting system.

Where allowable stress design methodologies are used with the special load combinations of Section 1605.4, design strengths are permitted to be determined using an allowable stress increase of 1.7 and a resistance factor, \( \phi \), of 1.0. This increase shall not be combined with increases in allowable stresses or load combination reductions otherwise permitted by this code or the material reference standard except that combination with the duration of load increases permitted in Chapter 23 is permitted.

Modify item 3 of proposal as follows:

1617.2 Redundancy. The provisions given in Section 9.5.2.4 of ASCE 7 shall be used, except that structures designed using the simplified analysis procedure in Section 1617.5 shall use the redundancy provisions in Sections 1617.2.2.

Section 1617.2.1 ASCE Section 9.5.2.4.2. Modify section 9.5.2.4.2 as follows:

9.5.2.4.2 Seismic Design Category D: For structures in Seismic Design Category D, shall be taken as the largest of the values of \( r_{max} \) calculated at each story “x” of the structure in accordance with equation 9.5.2.4.2-1 as follows:

\[
r_{max} = \frac{\sqrt{A \cdot \phi}}{20} \quad \text{(9.5.4.2-1)}
\]

where:

- \( r_{max} \) = The ratio of the design story shear resisted by the single element carrying the most shear force in the story to the total story shear, for a given direction of loading. For braced frames, the value of \( r_{max} \) is equal to the lateral force component in the most heavily loaded brace element divided by the story shear. For moment frames, \( r_{max} \) shall be taken as the maximum of the sum of the shears in any two adjacent columns in the plane of a moment frame divided by the story shear. For columns common to two bays with moment-resisting connections on opposite sides at the level
under consideration, 70 percent of the shear in that column may be used in the column shear summation. For shear walls, $r_{\text{max}}$ shall be taken equal to shear in the most heavily loaded wall or wall pier multiplied by $10/l_w$ (the metric coefficient is $3.3/l_w$), divided by the story shear, where $l_w$ is the wall or wall pier length in feet (m). The value of the ratio of $10/l_w$ need not to be greater than 1.0 for buildings of light-frame construction. For dual systems, $r_{\text{max}}$ shall be taken as the maximum value defined above, considering all lateral-load-resisting elements in the story. The lateral loads shall be distributed to elements based on relative rigidities considering the interaction of the dual system. For dual systems, the value of need not exceed 80 percent of the value calculated above.

$$A_x = \text{the floor area in square feet of the diaphragm level immediately above the story.}$$

The value of need not exceed 1.5, which may be used for any structure. The value of shall not be taken as less than 1.0.

**Exception:** For structures with seismic-force-resisting systems in any direction comprised solely of special moment frames, the seismic-force-resisting system shall be configured such that the value of calculated in accordance with this section does not exceed 1.25.

The metric equivalent of Eq. 9.5.2.4.2-1 is:

$$r = \frac{b l_i}{\sqrt{A_i}}$$

Where $A_i$ is in square meters.

For structures with vertical combinations of seismic-force-resisting systems, the value of shall be determined independently for each seismic-force-resisting system. The reliability/redundancy factor of the lower portion shall not be less than the following:

$$\rho_L = \frac{R_L \rho_u}{R_s}$$

where:
- $L_i = \text{of lower portion.}$
- $R_L = R$ of lower portion.
- $\rho_u = \text{of upper portion.}$
- $R_s = R$ of upper portion.

1617.2.2 Redundancy (for use in Simplified Analysis Procedure 1617.5). A redundancy coefficient, $r$, shall be assigned to all structures designed using the simplified analysis procedure in Section 1617.5 in accordance with this section, based on the extent of structural redundancy inherent in the lateral force resisting system.

Modify item 4 of proposal as follows:

1617.2.2.1 Seismic Design Category A, B or C. For structures assigned to Seismic Design Category A, B or C (see Section 1616), the value of the redundancy coefficient is 1.0.

1617.2.2.2 Seismic Design Categories D, E and F. For structures in Seismic Design Categories D, E and F (see Section 1616), the redundancy coefficient shall be taken as the largest of the values of calculated at each story “i” of the structure in accordance with Equation 16-32 as follows:

$$r_{\text{max}} = \frac{R_L \rho_u}{R_s}$$ (Equation 16-33)

where:
- $L_i = \text{of lower portion.}$
- $R_L = R$ of lower portion.
- $\rho_u = \text{of upper portion.}$

For SI:

$$r_{\text{max}} = 2 \frac{r_{\text{max}}}{\sqrt{A_i}}$$
$R = R$ of upper portion.

Modify item 5 of proposal as follows:

1617.3 Deflection and drift limits. The provisions given in Section 9.5.2.8.8 of ASCE 7 shall be used, except that structures designed using the simplified analysis procedure in Section 1617.5 shall meet the provisions in Sections 1617.3.1.

1617.3.1 Deflection and drift limits (for use in Simplified Analysis Procedure 1617.5). The design story drift, $D_s$, as determined in Section 1617.5.4, shall not exceed the allowable story drift, $D_o$, as obtained from Table 1617.3.1 for any story. All portions of the building shall be designed to act as an integral unit in resisting seismic forces unless separated structurally by a distance sufficient to avoid damaging contact under total deflection as determined by Section 1617.5.4.

Modify item 10 of proposal as follows:

1617.6 Seismic-force-resisting systems. The provisions given in Section 9.5.2.2 of ASCE 7 shall be used. In addition, the systems identified in Table 1617.6 shall use the provisions of Section 9.5.2.2 of ASCE 7 with the parameters identified in Table 1617.6 and subject to the limitations contained therein.

Exception: For structures designed using the simplified analysis procedure in Section 1617.5, the provisions of Section 1617.6.1 shall be used.

1617.6.1 Seismic-force-resisting systems (for use in Simplified Analysis Procedure 1617.5). The basic lateral and vertical seismic-force-resisting systems shall conform to one of the types indicated in Table 1617.6.1 subject to the limitations on height indicated in the table based on seismic design category as determined in Section 1616. The appropriate response modification coefficient, $R$, system overstrength factor, $o$, and deflection amplification factor, $C_d$, indicated in Table 1617.6.1 shall be used in determining the base shear, element design forces and design story drift. For seismic-force-resisting systems not listed in Table 1617.6.1, analytical and test data shall be submitted that establish the dynamic characteristics and demonstrate the lateral-force resistance and energy dissipation capacity to be equivalent to the structural systems listed in Table 1617.6.1 for equivalent response modification coefficient, $R$, system overstrength coefficient, $o$, and deflection amplification factor, $C_d$, values.

Exception: Structures assigned to Seismic Design Category A.

Modify item 11 of proposal as follows:

Retain and renumber Sections 1617.6.1 through 1617.6.3.2 as 1617.6.1.1 through 1617.6.1.3.2.

Remainder of item 11 as previously approved.

Modify item 12 of proposal as follows:

Retain and renumber current Table 1617.6 to 1617.6.1

Remainder of item 12 as previously approved.

Modify item 13 of proposal as follows:

Retain and renumber Table 1617.3 to 1617.3.1.

Remainder of item 13 as previously approved.

Items 6 through 9 as previously approved.

Commenter’s Reason: This code change was part of a package of seismic proposals from NCSEA/SEI that removed the bulk of the seismic provisions and adopted the ASCE 7-02 seismic provisions by reference. During the Structural Committee’s deliberations on that package, the committee decided that it preferred to leave the simplified analysis procedure in Section 1617.5 in the IBC itself, instead of removing it as was proposed. It was clear to me that the committee’s intent was to have a method in the IBC that would not require the use of ASCE 7 for certain smaller buildings. Code changes S41-02 and S43-02 were modified and approved leaving Section 1617.5 in place. However, in the haste of the hearing process, the committee did not modify other code changes in the package to leave in provisions necessary to use the simplified procedure without requiring users to go to ASCE 7. Such items include the $R$-factor, seismic load effect $E$, detailing requirements, and drift limits.

As IBC Structural Committee Chairman, I feel it is my responsibility to assure the intent of the committee is followed. I therefore propose these modifications to restore the required items to Chapter 16, allowing the simplified procedure to be used as a stand alone method.

S60-02

1620

Proposed Change as Submitted:

Proponent: James A. Rossberg (SEI of ASCE); representing Structural Engineering Institute of ASCE and David R. Bonneville (NCSEA); representing NCSEA Seismic Committee

1. Revise as follows:

1620.1 Structural component design and detailing. The design and detailing of the components of the seismic-force-resisting system shall comply with the requirements of this section 9.5.2.6 of ASCE 7 in addition to the non-seismic requirements of this code except as modified in Sections 1620.1.1, 1620.1.2 and 1620.1.3.

1620.1.1 ASCE 7, Section 9.5.2.6.2.5 Section 9.5.2.6.2.5 of ASCE 7 shall not apply.

1620.1.2 ASCE 7, Section 9.5.2.6.2.11. Modify ASCE 7, Section 9.5.2.6.2.11 to read as follows:

9.5.2.6.2.11 Elements supporting Discontinuous Walls or frames: Columns, beams, trusses, or slabs supporting discontinuous walls or frames of structures having plan irregularity Type 4 of Table 9.5.2.3.2 or vertical irregularity Type 4 of Table 9.5.2.3.3 shall have the design strength to resist the maximum axial force that can develop in accordance with the special seismic loads of Sec. 9.5.2.7.1.

Exceptions:
1. The quantity $E$ in Sec. 9.5.2.7.1 need not exceed the maximum force that can be transmitted to the element by the lateral-force-resisting system at yield.
2. Concrete slabs supporting light-frame walls.

1620.1.3 ASCE 7, Section 9.5.2.6.3. Modify ASCE 7, Section 9.5.2.6.3 to read as follows:
1620.1 Structural component design and detailing. The design and detailing of the components of the seismic-force-resisting system shall comply with the requirements of Section 9.5.2.6 of ASCE 7 in addition to the non-seismic requirements of this code except as modified in Sections 1620.1.1, 1620.1.2 and 1620.1.3.

1620.1.1 ASCE 7, Section 9.5.2.6.2.5 Section 9.5.2.6.2.5 of ASCE 7 shall not apply.

1620.1.2 ASCE 7, Section 9.5.2.6.2.11. Modify ASCE 7, Section 9.5.2.6.2.11 to read as follows:

9.5.2.6.2.11 Elements supporting Discontinuous Walls or frames: Columns, beams, trusses, or slabs supporting discontinuous walls or frames of structures and the connections of the discontinuous element to the supporting member having plan irregularity Type 4 of Table 9.5.2.3.2 or vertical irregularity Type 4 of Table 9.5.2.3.3 shall have the design strength to resist the maximum axial force that can develop in accordance with the special seismic loads of Sec. 9.5.2.7.1. Exceptions:
1. The quantity \( E \) in Sec. 9.5.2.7.1 need not exceed the maximum force that can be transmitted to the element by the lateral-force-resisting system at yield.
2. Concrete slabs supporting light-frame walls.

1620.1.3 ASCE 7, Section 9.5.2.6.3. Modify ASCE 7, Section 9.5.2.6.3 to read as follows:

9.5.2.6.3. Seismic Design Category C. Structures assigned to Category C shall conform to the requirements of Sec. 9.5.2.6.2 for Category B and to the requirements of this section. Structures that have plan structural irregularity Type 1a or 1b of Table 9.5.2.3.2 along both principal plan axes, or plan structural irregularity Type 5 of Table 9.5.2.3.2, shall be analyzed for seismic forces in compliance with Sec. 9.5.2.5.2.2. When the square root of the sum of the squares method of combining directional effects is used, each term computed shall be assigned the sign that will yield the most conservative result.

The orthogonal combination procedure of Sec. 9.5.2.5.2.2 Item a shall be required for any column or wall that forms part of two or more intersecting seismic-force-resisting systems and is subjected to axial load due to seismic forces acting along either principal plan axis equaling or exceeding 20% of the axial load design strength of the column or wall.

2. Delete without substitution:

Sections 1620.1.1 Second-order Load Effects through 1620.4.1 Plan or Vertical Irregularities (the remainder of current Section 1620 EARTHQUAKE LOADS - DESIGN DETAILING REQUIREMENTS AND STRUCTURAL COMPONENT LOAD EFFECTS).

Proponent’s Reason: The contents of IBC Section 1620 are largely the same as those of ASCE 7-02 Section 9.5.2.6. The proposed deletion of much of the text of IBC Section 1620 in favor of a reference to ASCE 7-02 Section 9.5.2.6:

Responds to requests from ICC Committees to remove complex technical provisions from the code in favor of simple references to consensus standards containing the same provisions.

Shortens the length of the IBC seismic design provisions.

Encourages technical code changes to go through a national consensus process.

Spares practitioners slightly different versions of essentially the same requirements in multiple documents.

Still leaves basic scoping requirements in the building code.

Increases overall efficiency in progressive development of technical provisions and avoids redundant and duplicate efforts.

ASCE 7-02 Section 9.5.2.6.2.5 is not referenced because, although the general philosophy embodied in this section is appealing, the enforceability of the section is questionable.

The two proposed modifications to ASCE 7-02 retain IBC Section 1620 provisions that are not included in ASCE 7-02 Section 9.5.2.6.

It should be pointed out that ASCE 7-02 Section 9.5.2.6.2.5 does not contain the IBC Section 1620.1.6 requirements that collector elements, splices and their connections to resisting elements shall have the design strength to resist the special load combinations of IBC Section 1605.4. The Exception to IBC Section 1620.1.6 is also not included in ASCE 7-02 Section 9.5.2.6.2.5.

It should also be pointed out that in ASCE 7-02 Section 9.5.2.6.4.4, the maximum diaphragm design force is 0.4 \( S_{cd} \) \( I_{w} \varphi \), whereas it is 0.3 \( S_{cd} \) \( I_{w} \) in Section 1620.3.3 of the IBC.

Please further note that the following requirements of ASCE 7-02 Section 9.5.2.6.3.2, which are applicable in Seismic Design Categories C and above, are applicable in the IBC only in Seismic Design Categories D and above:

“When elements of the wall anchorage system are loaded eccentrically or are not perpendicular to the wall, the system shall be designed to resist all components of the forces induced by the eccentricity.”

“When pilasters are present in the wall, the anchorage force at the pilasters shall be calculated considering the additional load transferred from the wall panels to the pilasters. However, the minimum anchorage force at a floor or roof shall not be reduced.”

Committee Action: Approved as Modified

Modify item 1 of proposal as follows:

9.5.2.6.3. Seismic Design Category C. Structures assigned to Category C shall conform to the requirements of Sec. 9.5.2.6.2 for Category B and to the requirements of this section. Structures that have plan structural irregularity Type 1a or 1b of Table 9.5.2.3.2 along both principal plan axes, or plan structural irregularity Type 5 of Table 9.5.2.3.2, shall be analyzed for seismic forces in compliance with Sec. 9.5.2.5.2.2. When the square root of the sum of the squares method of combining directional effects is used, each term computed shall be assigned the sign that will yield the most conservative result.

The orthogonal combination procedure of Sec. 9.5.2.5.2.2 Item a shall be required for any column or wall that forms part of two or more intersecting seismic-force-resisting systems and is subjected to axial load due to seismic forces acting along either principal plan axis equaling or exceeding 20% of the axial load design strength of the column or wall.

Item 2 approved as proposed

Committee Reason: Agreement with the proponent’s published reason. The modification addresses the potential weak link at the connection of a discontinuous system to the supporting member.

Staff Note: If the final version of ASCE 7-02 is not readily available and received for staff review by the deadline for receiving public comments,
S60-02 will be placed on the Final Action Individual Consideration Agenda. Also see staff note on code change S43-02.

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

James M. Delahay, Chairman, IBC Structural Committee, requests Approved as Modified by this comment.

Modify item 1 of proposal as follows:

1620.2 Structural component design and detailing. The design and detailing of the components of the seismic-force resisting system shall comply with the requirements of Section 9.5.2.6 of ASCE 7 in addition to the non-seismic requirements of this code except as modified in Sections 1620.1.1, 1620.1.2 and 16201.3.

Exception: For structures designed using the simplified analysis procedure in Section 1617.5, the provisions of Section 1620.2 shall be used.

1620.1 ASCE 7, Section 9.5.2.6.2.5 Section 9.5.2.6.2.5 of ASCE 7 shall not apply.

1620.2 ASCE 7, Section 9.5.2.6.2.11. Modify ASCE 7, Section 9.5.2.6.2.11 to read as follows:

9.5.2.6.2.11 Elements supporting Discontinuous Walls or frames: Columns, beams, trusses, or slabs supporting discontinuous walls or frames of structures and the connections of the discontinuous element to the supporting member having plan irregularity Type 4 of Table 9.5.2.3.2 or vertical irregularity Type 4 of Table 9.5.2.3.3 shall have the design strength to resist the maximum axial force that can develop in accordance with the special seismic loads of Sec. 9.5.2.7.1.

Exceptions:
1. The quantity E in Sec. 9.5.2.7.1 need not exceed the maximum force that can be transmitted to the element by the lateral-force-resisting system at yield.
2. Concrete slabs supporting light-frame walls.

1620.3 ASCE 7, Section 9.5.2.6.3. Modify ASCE 7, Section 9.5.2.6.3 to read as follows:

9.5.2.6.3. Seismic Design Category C. Structures assigned to Category C shall conform to the requirements of Sec. 9.5.2.6.2 for Category B and to the requirements of this section. Structures that have plan structural irregularity Type 1a or 1b of Table 9.5.2.3.2 along both principal plan axes, or plan structural irregularity Type 5 of Table 9.5.2.3.2. shall be analyzed for seismic forces in compliance with Sec. 9.5.2.5.2.2. When the square root of the sum of the squares method of combining directional effects is used, each term computed shall be assigned the sign that will yield the most conservative result.

The orthogonal combination procedure of Sec. 9.5.2.5.2.2 Item a shall be required for any column or wall that forms part of two or more intersecting seismic-force-resisting systems and is subjected to axial load due to seismic forces acting along either principal plan axis equaling or exceeding 20% of the axial load design strength of the column or wall.

S62-02

1620.3.1

Proposed Change as Submitted:

Proponent: David R. Bonneville (NCSEA); representing NCSEA Seismic Committee

Revise as follows:

1620.3.1 (Supp) Plan or vertical irregularities. For buildings having a plan structural irregularity of Type 1a, 1b, 2, 3 or 4 in Table 1616.5.1 or a vertical structural irregularity of Type 4 in Table 1616.5.2, the design forces determined from Section 1617.4.1 shall be increased 25 percent for connection of diaphragms to vertical elements and to collectors, and for connection of collectors to the vertical elements; and for diaphragm chords and diaphragm chord connections where plan structural irregularity Type 2 in Table 1616.5.1 exists.

Exception: When connection design forces are determined using the special seismic load combinations of Section 1605.4
For buildings having a plan structural irregularity of Type 4 in Table 1616.5.1, diaphragms or horizontal bracing that transfers forces between horizontally offset vertical lateral force resisting elements shall be designed using the Special Load Combinations of Section 1605.4.

**Proponent’s Reason:** Chords should also be explicitly mentioned as members and connections subject to the 25% increase in design forces where re-entrant corners occur. The 25% additional increase should not apply to collectors that are subject to the Special Load Combinations of Section 1605.4.

Diaphragms or horizontal bracing used to transfer seismic forces from offset vertical lateral force resisting elements should remain essentially elastic since the yielding of these elements is not explicitly considered in defining these systems. The use of the Special Load Combinations will substantially reduce the ductility demands on the horizontal bracing or diaphragm under these conditions.

**Committee Action:** Disapproved

**Committee Reason:** Based on action taken on S60-02.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because public comments were submitted.

**Public Comment 1:**

Chris Tokas, Structural Engineers Association of California; representing SEAOC Seismology Committee, requests Approved as Submitted.

**Commenter’s Reason:** The proponent mistakenly requested disapproval of this code change assuming it was already addressed by ASCE 7-02. This code change contains provisions which are not currently covered by any referenced standard. Chords should also be explicitly mentioned as subject to the 25% increase and when re-entrant corners exist. Plan irregularities which result in seismic forces being transferred through concrete diaphragms or steel horizontal bracing elements acting similar to floor diaphragms should remain essentially elastic. The use of the Special Seismic Load Combinations will reduce the ductility demands caused by this irregularity on the diaphragm system as intended by the building code provisions.

**Public Comment 2:**

James M. Delahay, Chairman, IBC Structural Committee, requests Approved as Submitted.

**Commenter’s Reason:** This code change was part of a package of seismic proposals from the NCSEA Seismic Committee that was voted disapproved by the IBC Structural Committee only because the provisions they modify were being removed in favor of a reference to ASCE 7-02. In other public comments, I have suggested that portions of removed material be restored in order to comply with the committee’s intent of having a stand alone simplified method. This Code change proposal would affect that restored material. As IBC Structural Committee Chairman, I felt compelled to file this comment to open the proposal for reconsideration. This reconsideration would only apply if my modifications to S60-02 are accepted.

During the hearings, the committee did not debate this code change, but has been very favorable in the past to seismic changes proposed by NCSEA. However, as Chairman, I am neither endorsing nor opposing the proposal, just placing it on the agenda to be heard. I will rely upon NCSEA to provide testimony about its merits.

**S63-02**

1620.3.3

**Proposed Change as Submitted:**

**Proponent:** Gerald Jones, Code Resource Support Committee (CRSC Chair); representing Building Seismic Safety Council (BSSC) Code Resource Support Committee

**Revise as follows:**

1620.3.3 (Supp) Diaphragms. Floor and roof diaphragms shall be designed to resist design seismic forces determined in accordance with Equation 16-65 as follows:

\[
F = F_i + F_{px} + \sum_{i} w_i \cdot w \cdot \sin \left( \frac{x}{n} \right) \cdot \text{Equation 16-65}
\]

where:

- \( F_i \) = The design force applied to Level \( i \).
- \( F_{px} \) = The diaphragm design force.
- \( w_i \) = The weight tributary to Level \( i \).
- \( w_{px} \) = The weight tributary to the diaphragm at Level \( x \).

The force determined from Equation 16-65 need not exceed \( 0.43S_{Ds}w_{px} \), but shall not be less than \( 0.2S_{Ds}w_{px} \), where \( S_{Ds} \) is the design spectral response acceleration at short period determined in Section 1615.1.3 and \( I_e \) is the occupancy importance factor determined in Section 1616.2. When the diaphragm is required to transfer design seismic force from the vertical resisting elements above the diaphragm to other vertical resisting elements below the diaphragm due to offsets in the placement of the elements or to changes in relative lateral stiffness in the vertical elements, these forces shall be added to those determined from Equation 16-65 and to the upper and lower limits on that formula.

**Proponent’s Reason:** The proposed code change makes the maximum diaphragm design force of the IBC in Seismic Design Category D and above consistent with that of the 2000 NEHRP Recommended Provisions (Section 5.2.6.4.4) and ASCE 7 (Section 9.5.2.6.4.4). The 1997 Uniform Building Code prescribes a consistent maximum diaphragm design force level for structures in all seismic zones.
Committee Action: Disapproved

Committee Reason: Based on action taken on S60-02.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

James M. Delahay, Chairman, IBC Structural Committee, requests Approved as Submitted.

Commenter's Reason: This code change was part of a package of seismic proposals from BSSC's Code Resource Support Committee (CRSC) that was voted disapproved by the IBC Structural Committee only because the provisions they modify were being removed in favor of a reference to ASCE 7-02. In other public comments, I have suggested that portions of removed material be restored in order to comply with the committee's intent of having a stand alone simplified method. This Code change proposal would affect that restored material. As IBC Structural Committee Chairman, I felt compelled to file this comment to open the proposal for reconsideration. This reconsideration would only apply if my modifications to S60-02 are accepted.

During the hearings, the committee did not debate this code change, but has been very favorable in the past to seismic changes proposed by CRSC. However, as Chairman, I am neither endorsing nor opposing the proposal, just placing it on the agenda to be heard. I will rely upon the CRSC to provide testimony about it's merits.

S95-02

1714.5.1 (IRC R613.3)

Proposed Change as Submitted:

Proponent: Julie Ruth, Jruth Code Consulting; representing American Architectural Manufacturers Association (AAMA)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IBC 1714.5.1 Aluminum, vinyl and wood exterior windows and glass doors. Aluminum, vinyl and wood exterior windows and glass doors shall be labeled as conforming to AAMA/NWWDA/101/I.S.2 or NAFS-1. The label shall state the name of the manufacturer, the approved labeling agency and the product designation as specified in AAMA/NWWDA/101/I.S.2 or NAFS-1. Products tested and labeled as conforming to AAMA/NWWDA/101/I.S.2 or NAFS-1 shall be subject to the requirements of Sections 2403.2 and 2403.3.

2. IRC R616.3 Testing and labeling. Exterior windows and glass doors shall be tested by an approved independent laboratory, and bear a label identifying manufacturer, performance characteristics and approved inspection agency to indicate compliance with the requirements of one of the following specifications:

AAMA/NWWDA 101/ I.S. 2

NAFS-1

Exceptions:

Decorative glazed openings. Exterior windows and door assemblies not included within the scope of AAMA / NWWDA 101 / I.S.2 OR NAFS-1 shall be tested in accordance with ASTM E330. Assemblies covered by this exception containing glass shall comply with Section R308.5.

No change to exceptions 3 and 4.

Proponent's Reason: This code change introduces reference to the North American Fenestration Standard (NAFS-1) - 00 Voluntary Performance Specification for Windows, Skylights and Glass Doors to the IBC and IRC. NAFS-1 was developed as a harmonized standard between Canada and the United States for windows, skylights and glass doors. Participants in the development of this specification included representatives of American Architectural Manufacturers Association (AAMA), Canadian Standards Association (CSA), Canadian Window and Door Manufacturers Association (CWDMA), National Fenestration Rating Council (NFRC), National Research Council of Canada (NRC/IRC) and Window and Door Manufacturers Association (WDMA).

AAMA and WDMA (formerly NWWDA) have participated in the development of NAFS-1 as a replacement to AAMA/NWWDA 101/I.S., which is currently referenced in the IBC, the IRC and the IECC. Some of the significant improvements of NAFS-1 over AAMA/NWWDA 101/I.S.2 include:

- The addition of skylights, specialty products, side lites and transoms to the specification, bringing the total number of operating types recognized in the standard to 26.
- The addition of spreadsheets figures and tables to clarify the requirements of specification.
- The addition of new deflection limits for certain commercial applications.
- The updating of the Operating Force test requirements to the new ASTM E2068 test method.
- The introduction of metric based requirements that are consistent with international standards such as ISO, JIS and CEN standards, as well as the US Federal directives concerning metrication of construction products.
- Expanded descriptions of mullions types and their performance requirements.
Pile group effects from soil on lateral pile and bending moments due to inclined shall be considered within seven pile diameters of the pile center-to-center spacing, where the combined effect of axial loads have the capacity to resist uplift forces or provide rotational restraint, and design professional. Where the ratio of the depth of embedment of the pile-to-pile diameter or width is less than or equal to six, the pile may be assumed to be rigid.

Pier or pile: Pile group effects from soil on lateral pile capacity nominal strength shall be considered included where pile center-to-center spacing is less than 8 pile diameters. Pile group effects on vertical capacity nominal strength shall be considered included where pile center-to-center spacing is less than 3 pile diameters. The pile uplift soil nominal strength shall be taken as the pile uplift strength as limited by the frictional force developed between the soil and the pile.

Where a minimum length for reinforcement or the extent of closely spaced confinement reinforcement is specified at the top of the pier or pile, provisions shall be made so that those specified lengths or extents are maintained after pier or pile cut-off.

2. 1808.2.23.2.1 (Supp) Design details for piers, piles and grade beams. Piers or piles shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-pile-structure interaction coupled with pier or pile deformations induced by lateral pier or pile resistance to structure seismic forces. Concrete piers or piles on Site Class E or F sites, as determined in Section 1615.1.1, shall be designed and detailed in accordance with requirements for concrete special moment frames (see Table 1617.6 for reference). Sec. 21.4.4.1, 21.4.4.2, and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and the interfaces of soft to medium stiff clay or liquefiable strata. For precast prestressed concrete piles, detailing provisions as given in Sections 1809.2.3.2.1 and 1809.2.3.2.2 shall apply.

Grade beams shall be designed as beams in accordance with ACI 318, Chapter 21. When grade beams have the capacity to resist the forces from the load combinations in Section 1605.4, they need not conform to ACI 318, Chapter 21.

3. 1808.2.23.2.2 Connection to pile cap. For piles required to resist uplift forces or provide rotational restraint, design of anchorage of piles into the pile cap shall be provided considering the combined effect of axial forces due to uplift forces and bending moments due to

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**ITEM 1 (IBC)**

Committee Action: Approved as Submitted

Assembly Action: No Motion

**ITEM 2 (IRC)**

Committee Action: Approved as Submitted

Assembly Action: No Motion

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**S107-02**

**1808.2.23.1.2, 1808.2.23.2, 1808.2.23.2.2**

**Proposed Change as Submitted:**

Proponent: Gerald Jones (CRSC Chair) and Maury Power (Technical Subcommittee on Foundations and Geotechnical Considerations Chair) ; representing Building Seismic Safety Council (BSSC) Code Resource Support Committee

**Revise as follows:**

1. **1808.2.23.1.2 (Supp) Design Details.** Pier or pile moments, shears and lateral deflections used for design shall be established considering the nonlinear interaction of the shaft and soil, as recommended by a registered design professional. Where the ratio of the depth of embedment of the pile-to-pile diameter or width is less than or equal to six, the pile may be assumed to be rigid.

Pier or pile: Pier or pile effects from soil on lateral pile capacity nominal strength shall be considered included where pile center-to-center spacing is less than 8 pile diameters. Pile group effects on vertical capacity nominal strength shall be considered included where pile center-to-center spacing is less than 3 pile diameters. The pile uplift soil nominal strength shall be taken as the pile uplift strength as limited by the frictional force developed between the soil and the pile.

Where a minimum length for reinforcement or the extent of closely spaced confinement reinforcement is specified at the top of the pier or pile, provisions shall be made so that those specified lengths or extents are maintained after pier or pile cut-off.

2. **1808.2.23.2.1 (Supp) Design details for piers, piles and grade beams.** Piers or piles shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-pile-structure interaction coupled with pier or pile deformations induced by lateral pier or pile resistance to structure seismic forces. Concrete piers or piles on Site Class E or F sites, as determined in Section 1615.1.1, shall be designed and detailed in accordance with requirements for concrete special moment frames (see Table 1617.6 for reference). Sec. 21.4.4.1, 21.4.4.2, and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and the interfaces of soft to medium stiff clay or liquefiable strata. For precast prestressed concrete piles, detailing provisions as given in Sections 1809.2.3.2.1 and 1809.2.3.2.2 shall apply.

Grade beams shall be designed as beams in accordance with ACI 318, Chapter 21. When grade beams have the capacity to resist the forces from the load combinations in Section 1605.4, they need not conform to ACI 318, Chapter 21.

3. **1808.2.23.2.2 Connection to pile cap.** For piles required to resist uplift forces or provide rotational restraint, design of anchorage of piles into the pile cap shall be provided considering the combined effect of axial forces due to uplift forces and bending moments due to
fixity to the pile cap. Anchorage shall develop a minimum of 25 percent of the strength of the pile in tension. For piles required to resist uplift forces or provide rotational restraint, anchorage into the pile cap shall be capable of developing, at a minimum, the lesser of the following:

1. The tensile strength of the longitudinal reinforcement in a concrete pile or the tensile strength of a steel pile.
2. 1.3 times the pile uplift capacity in the soil.

1. In the case of uplift, the lesser of the nominal tensile strength of the longitudinal reinforcement in a concrete pile, or the nominal tensile strength of a steel pile, or the pile uplift soil nominal strength factored by 1.3, or the axial tension force resulting from the load combinations of Sec. 5.2.7.1.

2. In the case of rotational restraint, the lesser of the axial and shear forces, and moments resulting from the load combinations of Section 5.2.7.1 or development of the full axial, bending, and shear nominal strength of the pile.

**Proponent’s Reason:** The revisions proposed for Section 1808.23.1.2 are to make the IBC consistent with the 2000 NEHRP Recommended Provisions.

The same confinement as for special moment frame columns is required for reinforced concrete piles embedded in soft (Site Class E or F) soils, within seven pile diameters from the pile-pile cap interface, where the curvatures are high. A reduced transverse steel ratio from that required in special moment frame columns is permitted in reinforced concrete piles below the specially reinforced segment, reflecting smaller curvatures and confinement provided by the soil. Precast prestressed concrete piles are exempt from the full special moment frame column requirements since these requirements were never intended for slender precast prestressed concrete elements. It has been proven through cyclic testing that precast prestressed piles with substantially less confinement reinforcement perform adequately.

Anchorage of the pile-to-pile cap should be conservatively designed to allow energy dissipating mechanisms, such as rocking, to occur in the soil without structural failure of the pile.

**Committee Action:** Approved as Modified

Modify item 3 of proposal as follows:

1. In the case of uplift, the lesser of the nominal tensile strength of the longitudinal reinforcement in a concrete pile, or the nominal tensile strength of a steel pile, or the pile uplift soil nominal strength factored by 1.3, or the axial tension force resulting from the load combinations of Sec. 5.2.7.1.

2. In the case of rotational restraint, the lesser of the axial and shear forces, and moments resulting from the load combinations of

**Items 1 & 2 approved as proposed.**

**Committee Reason:** Based on proponent’s published reason. The modification provides correct IBC section references.

**Staff note:** Should S43-02 ultimately be approved, the section reference will be changed to the corresponding section of ASCE 7.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Chris V. Tokas, Structural Engineers Association of California; representing SEAOC Seismology Committee, requests Approved as Modified by this comment.

**Modify item 3 of proposal as follows:**

1. **1808.23.2.2 Connection to pile cap**. For piles required to resist uplift forces or provide rotational restraint, design of anchorage of piles into the pile cap shall be provided considering the combined effect of axial forces due to uplift and bending moments due to fixity to the pile cap. Anchorage shall develop a minimum of 25 percent of the strength of the pile in tension. Anchorage into the pile cap shall be capable of developing the following:

   1. In the case of uplift, the lesser of the nominal tensile strength of the longitudinal reinforcement in a concrete pile, or the nominal tensile strength of a steel pile, or the pile uplift soil nominal strength factored by 1.3, or the axial tension force resulting from the load combinations of Sec. 5.2.7.1.

   2. In the case of rotational restraint, the lesser of the axial and shear forces, and moments resulting from the load combinations of

   **Items 1, 2 & 4 as previously approved.**

   **Commenter’s Reason:** The proponent mistakenly referenced the definition of E in 1617.1.1 instead of the special seismic load combinations in Section 1604.5 which are similar to that in NEHRP Section 5.2.7.1.

**S115-02**

**Chapter 19**

**Proposed Change as Submitted:**
Proponent: Joseph J. Messersmith, Jr, Portland Cement Association and Dan Falconer, American Concrete Institute

1. Revise as follows:

1901.4 Construction documents. The construction documents for structural concrete construction shall include:

No change to items 1 and 2.

3. The size and location of structural elements and reinforcement, and anchors.

No change to items 4 through 10.

11. For structures assigned to Seismic Design Category D, E or F, a statement if slab on grade is designed as a structural diaphragm. See Section 21.610.3.4 of ACI 318.

2. Revise as follows:

1902.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

DUCT. A conduit (plain or corrugated) to accommodate prestressing steel for post-tensioned installation.

POST-TENSIONING. Method of prestressing in which prestressing steel is tensioned after concrete has hardened.

PRETENSIONING. Method of prestressing in which prestressing steel is tensioned before concrete is placed.

PRESTRESSING STEEL. High-strength steel element such as wire, bar, or strand, or a bundle of such elements, used to impart prestress forces to concrete.

REINFORCED CONCRETE. Structural concrete reinforced with no less than the minimum amounts of prestressing tendons steel or nonprestressed reinforcement specified in ACI 318, Chapters 1 through 21 and Appendices A through C.

REINFORCEMENT. Material that conforms to Section 1903.5, excluding prestressing tendons steel unless specifically included.

TENDON. A steel element such as wire, cable, bar, rod, or strand, or a bundle of such elements, used to impart prestress to concrete. In pretensioning applications, the tendon is the prestressing steel. In post-tensioned applications, the tendon is a complete assembly consisting of anchorages, prestressing steel, and sheathing with coating for unbonded applications or ducts with grout for bonded applications.

Remaining definitions are unchanged.

3. Revise as follows:

1903.5.1 Reinforcement type. Reinforcement shall be deformed reinforcement, except plain reinforcement is permitted for spirals or tendons prestressing steel, and reinforcement consisting of structural steel, steel pipe or steel tubing is permitted where specified in ACI 318. Reinforcement shall comply with ACI 318, Section 3.5.

4. Revise as follows:

1904.4.2 (Supp) Exposure to chlorides. Where concrete with reinforcement will be exposed to chlorides from deicing chemicals, salt, salt water, brackish water, seawater or spray from these sources, the requirements of Table 1904.2.2(1) for water-cementitious materials ratio and concrete strength, and the minimum concrete cover requirements of Section 1907.7 shall be satisfied. See ACI 318, Section 18.16 for corrosion protection of unbonded prestressing tendons.

5. Revise as follows:

1907.4.2 Rust or mill scale. Except for prestressing tendons steel, steel reinforcement with rust, mill scale or a combination of both, shall be considered satisfactory, provided the minimum dimensions, including height of deformations and weight of a hand-wire-brushed test specimen, comply with applicable ASTM specifications. See Section 1903.5.

6. Revise as follows:

1907.4.3 Prestressing tendons steel. Prestressing tendons steel shall be clean and free of oil, dirt, scale, pitting and excessive rust. A light coating of rust is permitted.

7. Revise as follows:

1907.5.1 Support. Reinforcement, including prestressing tendons, and post-tensioning ducts shall be accurately placed and adequately supported before concrete is placed, and shall be secured against displacement within tolerances permitted in Section 1907.5.2. Where approved by the registered design professional, embedded items (such as dowels or inserts) that either protrude from precast concrete members or remain exposed for inspection are permitted to be embedded while the concrete is in a plastic state, provided the following conditions are met:

No change to items 1 through 3.
8. Revise as follows:

1907.5.2 Tolerances. Unless otherwise specified by the registered design professional, reinforcement, including prestressing tendons, and prestressing post-tensioning ducts shall be placed within the tolerances specified in Sections 1907.5.2.1 and 1907.5.2.2.

9. Revise as follows:

1907.6 Spacing limits for reinforcement. The clear distance between reinforcing bars, bundled bars, prestressing tendons and ducts shall comply with ACI 318, Section 7.6.

10. Revise as follows:

1903.2 Cement. Cement used to produce concrete shall comply with ACI 318, Section 3.2. In addition to the cements permitted by ACI 318, cement complying with ASTM C 595 is permitted.

11. Revise as follows:

| TABLE 1904.2.3 |
| REQUIREMENTS FOR CONCRETE EXPOSED TO DEICING SALTS |

No change to table entries.
No change to footnote a.
No change to footnote c.

12. Revise as follows:

1905.1.1 Strength. Concrete shall be proportioned to provide an average compressive strength as prescribed in Section 1905.3, as well as and shall satisfy the durability criteria of Section 1904. Concrete shall be produced to minimize the frequency of strengths below $f'_c$ as prescribed in Section 1905.6.3.3. For concrete designed and constructed in accordance with this chapter, $f'_c$ shall not be less than 2,500 psi (17.22 MPa). For concrete designed and constructed in accordance with this chapter, $f'_c$ shall not be less than 2,500 psi (17.22 MPa). No maximum specified compressive strength shall apply unless restricted by a specific provision of this code or ACI 318.

13. Revise as follows:

1905.2.3 Basis of proportions. Concrete proportions, including water-cementitious materials ratio, shall be established on the basis of field experience and/or trial mixtures with materials to be employed in accordance with Section 1905.3; except as permitted in or Section 1905.4, or required by and shall comply with the applicable requirements of Section 1904.

14. Revise as follows:

1905.6.3.3 Acceptance of results. The strength level of an individual class of concrete shall be considered satisfactory if both of the following requirements are met:

No change to item 1.
2. No individual strength test (average of two cylinders) falls below $f'_c$ by more than 500 psi (3.45 MPa) when $f'_c$ is 5,000 psi or less, or by more than 0.10$f'_c$ when $f'_c$ is more than 5,000 psi.

15. Revise as follows:

1905.6.5.1 Precaution. If any strength test (see Section 1905.6.2.4) of laboratory-cured cylinders falls below the specified value of $f'_c$ by more than 500 psi (3.45 MPa) (see the values given in Section 1905.6.3.3, Item 2), or if tests of field-cured cylinders indicate deficiencies in protection and curing (see Section 1905.6.4.4), steps shall be taken to assure that the load-carrying capacity of the structure is not jeopardized.

16. Revise as follows:

1905.6.5.2 Core tests. If the likelihood be tested dry. In such cases, three cores shall be taken for each strength test more than 500 psi (3.45 MPa) below the specified value of $f'_c$ that falls below the values given in 1905.6.3.3, Item 2.

17. Delete and substitute as follows:

1905.6.5.3 Condition of cores. If concrete in the structure will be dry under service conditions, cores shall be air dried at temperatures between 60°F (15.6°C) and 80°F (26.7°C) and relative humidity less than 60 percent for seven days before testing and shall be tested dry. If concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 40 hours and be tested wet. Cores shall be prepared for transport and storage by wiping drilling water from their surfaces and placing the cores in watertight bags or containers immediately after drilling. Cores shall be tested no earlier than 48 hours and not later than 7 days after coring unless approved by the registered design professional.

18. Revise as follows:

1907.5.1 Support. Reinforcement, including prestressing tendons, and post-tensioning ducts shall be accurately placed and adequately supported before concrete is
placed, and shall be secured against displacement within tolerances permitted in Section 1907.5.2. Where approved by the registered design professional, embedded items (such as dowels or inserts) that either … (remainder unchanged).

19. Revise as follows:

1907.5.2.2 Bends and ends. Tolerance for longitudinal location of bends and ends of reinforcement shall be ± 2 inches (± 51 mm) except at discontinuous ends of members where the tolerance shall be ± ½ inch (± 12.7 mm) at the discontinuous ends of brackets and corbels, and ± 1 inch at the discontinuous ends of other members. The tolerance for minimum concrete cover of Section 1907.5.2.1 shall also apply at discontinuous ends of members.

20. Revise as follows:

1907.7.1 Cast-in-place concrete (nonprestressed). Minimum concrete cover shall be provided for reinforcement in nonprestressed, cast-in-place concrete construction in accordance with Table 1907.7.1, shall not be less than required by Sections 1907.7.5 and 1907.7.7.

21. Revise as follows:

1907.7.32 Cast-in-place concrete (Prestressed) concrete. The minimum concrete cover for prestressed and nonprestressed reinforcement, ducts, and end fittings in cast-in-place prestressed concrete shall comply with ACI 318, Section 7.7.32.

22. Revise as follows:

1907.7.23 Precast concrete (manufactured under plant control conditions). The minimum concrete cover for prestressed and nonprestressed reinforcement, ducts, and end fittings in precast concrete manufactured under plant control conditions shall comply with ACI 318, Section 7.7.23.

23. Revise as follows:

1907.7.5 Corrosive environments. In corrosive environments or other severe exposure conditions, the amount of concrete protection shall be suitably increased, and the denseness and nonporosity of the protecting concrete shall be considered, or other protection shall be provided prestressed and nonprestressed reinforcement shall be provided with additional protection in accordance with ACI 318, Section 7.7.5.

24. Revise as follows:

1908.1 General. The text of ACI 318 shall be modified as indicated in Sections 1908.1.1 through 1908.1.11.

25. Delete without substitution:

1908.1.1 ACI 318, Section 8.1.2. Modify ACI 318, Section 8.1.2 to read as follows:

8.1.2 Except for load combinations that include earthquake loads, design of nonprestressed reinforced concrete members using Appendix A, Alternate Design Method, is permitted.

1908.1.2 ACI 318, Section 9.2.3. Modify Section 9.2.3 to read as follows:

9.2.3 Where resistance to specified earthquake loads or forces E are included in design, the load combinations of Section 1605.2 of the International Building Code® for strength design shall apply.

1908.1.3 ACI 318, Section 18.9.3. Modify ACI 318 Section 18.9.3 to read as follows:

18.9.3 For two-way-slab systems, minimum area and distribution of bonded reinforcement shall be as required in 18.9.3.1, 18.9.3.2, and 18.9.3.3.

1908.1.4 ACI 318, Section 21.0. Add the following notations to ACI 318, Section 21.0:

\[ h = \text{Overall dimension of member in the direction of action considered} \]

\[ S_r \text{ Connection} = \text{Moment, shear or axial force at connection cross section other than the nonlinear action location corresponding to probable strength at the nonlinear action location, taking gravity load effects into consideration per Section 21.2.8.3.} \]

\[ S_n \text{ Connection} = \text{Nominal strength of connection cross section in flexural, shear or axial action per Section 21.2.8.3.} \]

\[ D_m = C_D D_s \]

\[ D_s = \text{Design level response displacement, which is the total drift or total story drift that occurs when the structure is subjected to the design seismic forces.} \]

\[ y = \text{Dynamic amplification factor from Sections 21.2.8.3 and 21.2.8.4.} \]
26. Revise as follows:

1908.1.51 ACI 318, Section 21.1. Modify existing definitions and add the following definitions to ACI 318, Section 21.1.

CONNECTION. An element that joins two precast members or a precast member and a cast-in-place member.

DESIGN DISPLACEMENT. Total lateral displacement expected for the design-basis earthquake, as specified by Section 1617.4.6 or 1617.5.3 of the International Building Code®.

DESIGN LOAD COMBINATIONS. Combinations of factored loads and forces specified in Section 1605.2 of the International Building Code®.

DRY CONNECTION. Connection used between precast members that does not qualify as a wet connection.

JOINT. The geometric volume common to the intersecting members.

NONLINEAR ACTION LOCATION. Center of the region of yielding in flexure, shear or axial action.

NONLINEAR ACTION REGION. The member length over which nonlinear action takes place. It shall be taken as extending a distance of no less than h/2 on either side of the nonlinear action location.

STRONG CONNECTION. A connection that remains elastic while the designated nonlinear action regions undergo inelastic response under the design-basis ground motion.

WALL PIER. A wall segment with a horizontal length-to-thickness ratio of at least 2.5, but not exceeding 6, whose clear height is at least two times its horizontal length.

WET CONNECTION. A connection that uses any of the splicing methods permitted by Sections 21.3.2.3 or 21.3.2.4 to connect precast members and uses cast-in-place concrete or grout to fill the splicing closure.

27. Delete without substitution:

1908.1.6 ACI 318, Section 21.2.1. Add new Sections 21.2.1.6 and 21.2.1.7:

21.2.1.6 Precast lateral-force-resisting systems shall satisfy either of the following criteria:

1. It emulates the behavior of monolithic reinforced concrete construction and satisfies Section 21.2.1.5, or

2. It relies on the unique properties of a structural system composed of interconnected precast elements and it is demonstrated by experimental evidence to—safely—sustain the seismic loading requirements of a comparable monolithic reinforced concrete structure satisfying Chapter 21. Substantiating experimental evidence of acceptable performance of those elements required to sustain inelastic deformations shall be based on cyclic inelastic testing of specimens representing those elements.

21.2.1.7 In structures having precast gravity load carrying systems, the lateral-force-resisting system shall be one of the systems listed in Table 1617.6 of the International Building Code® and shall be well distributed using one of the following methods:

1. The lateral force resisting system shall be spaced such that the span of the diaphragm or diaphragm segment between lateral force resisting systems shall be no more than three times the width of the diaphragm or diaphragm segment. Where the lateral force resisting system consists of moment-resisting frames, at least $N_b/4 + 1$ of the bays (rounded up to the nearest integer) along any frame line at any story shall be part of the lateral force-resisting system where $N_b$ is the total number of bays along that line at that story. This requirement applies to only the lower two-thirds of the stories of buildings three stories or taller.

2. Beam to column connections that are not part of the lateral-force-resisting system shall be designed in accordance with the following:

Connection Design Force. The connection shall be designed to develop strength $M$. $M$ is the moment developed at the connection when the frame is displaced by $D_s$ assuming fixity at the connection and a beam flexural stiffness of no more than one-half of the gross section stiffness. $M$ shall be sustained through a deformation of $D_m$.

Connection Characteristics. The connection shall be permitted to resist moment in one direction only, positive or negative. The connection at the opposite end of the member shall resist moment with the same...
positive or negative sign. The connection shall be permitted to have zero flexural stiffness up to a frame displacement of $D_m$.

In addition, complete calculations for the deformation compatibility of the gravity load-carrying system shall be made in accordance with Section 1617.6.4.3 of the International Building Code® using cracked section stiffness in the lateral-force-resisting system and the diaphragm.

Where gravity columns are not provided with lateral support on all sides, a positive connection shall be provided along each unsupported direction parallel to a principal plan axis of the structure. The connection shall be designed for a horizontal force equal to 4 percent of the axial load strength, $P_{o}$, of the column.

The bearing length shall be calculated to include end rotation, sliding and other movements of precast ends at supports due to earthquake motions in addition to other movements and shall be at least 2 inches (51 mm) more than that required.

1908.1.7 ACI 318, Section 21.2.2. Add new Sections 21.2.2.5, 21.2.2.6 and 21.2.2.7 to ACI 318, Section 21.2.2 to read as follows:

21.2.2.5 Precast structural systems using frames and emulating the behavior of monolithic reinforced concrete construction shall satisfy either Sections 21.2.2.6 or 21.2.2.7.

21.2.2.6 Precast structural systems utilizing wet connections shall comply with the applicable requirements of monolithic concrete construction for resisting seismic forces.

21.2.2.7 Precast structural systems not meeting Section 21.2.2.6 shall utilize strong connections resulting in nonlinear response away from connections. Design shall satisfy the requirements of Section 21.2.8 in addition to the applicable requirements of monolithic concrete construction for resisting seismic forces, except that provisions of Section 21.3.1.2 shall apply to the segments between nonlinear action locations.

28. Revise as follows:

1908.1.82 ACI 318, Section 21.2.5. Modify ACI 318, Section 21.2.5 by renumbering as Section 21.2.5.1 and adding new Sections 21.2.5.2 and 21.2.5.3 and 21.2.5.4 to read as follows:

21.2.5 Reinforcement in members resisting earthquake-induced forces.

21.2.5.1 Except as permitted in Sections 21.2.5.2 through 21.2.5.9, reinforcement resisting earthquake-induced flexural and axial forces in frame members and in structural wall boundary elements shall comply with ASTM A 706. ASTM 615 Grades 40 and 60 reinforcement shall be permitted in these members if (a) the actual yield strength based on mill tests does not exceed the specified yield strength by more than 18,000 psi (retests shall not exceed this value by more than an additional 3,000 psi), and (b) the ratio of the actual ultimate tensile strength to the actual tensile yield strength is less than 1.25.

21.2.5.2 Prestressing tendons steel shall be permitted in flexural members of frames provided the average prestress, $f_p$, calculated for an area equal to the member’s shortest cross-sectional dimension multiplied by the perpendicular dimension shall be the lesser of 700 psi (4.83 MPa) or $f_{pc}/6$ at locations of nonlinear action where prestressing tendons are steel is used in members of frames.

21.2.5.3 Unless the seismic-force-resisting frame is qualified for use through structural testing as required by the ACI Provisional Standard ITG/T1.1, for members in which prestressing tendons are steel is used together with mild reinforcement to resist earthquake-induced forces, prestressing tendons steel shall not provide more than one quarter of the strength for both positive moments and negative moments at the joint face nonlinear action location and shall extend through exterior joints and be anchored at the exterior face of the joint or beyond.

21.2.5.4 Anchorages for tendons must be demonstrated to perform satisfactorily for seismic loadings. Anchorage assemblies shall withstand, without failure, a minimum of 50 cycles of loading ranging between 40 and 85 percent of the minimum specified tensile strength of the tendon prestressing steel.

29. Delete without substitution:

1908.1.9 ACI 318, Section 21.2. Modify ACI 318, Section 21.2 by adding a new Section 21.2.8 to read as follows:

21.2.8 Emulation of monolithic construction using strong connections. Members resisting earthquake-induced forces in precast frames using strong connections shall satisfy the following:

21.2.8.1 Location. Nonlinear action location shall be selected so that there is a strong column/weak beam
21.2.8.2 Anchorage and splices. Reinforcement in the nonlinear action region shall be fully developed outside both the strong connection region and the nonlinear action region. Noncontinuous anchorage reinforcement of the strong connection shall be fully developed between the connection and the beginning of the nonlinear action region. Lap splices are prohibited within connections adjacent to a joint.

21.2.8.3 Design forces. Design strength of strong connections shall be based on:

\[ f_{S_{\text{Connection}}} > Y S_{e_{\text{Connection}}} \]

Dynamic amplification factor, \( Y \), shall be taken as 1.0.

21.2.8.4 Column-to-column connection. The strength of column-to-column connections shall comply with Section 21.2.8.3 with \( Y \) taken as 1.4. Where column-to-column connections occur, the columns shall be provided with transverse reinforcement as specified in Sections 21.4.4.1 through 21.4.4.3 over their full height if the factored axial compressive force in these members, including seismic effects, exceeds \( A_g f'_c /10 \).

**Exception:** Where the column-to-column connection is located within the middle-third of the column clear height, the following shall apply: (a) the design moment strength, \( M_{\text{res}} \), of the connection shall not be less than 0.4 times the maximum \( M_{\text{res}} \) for the column within the story height, and (b) the design shear strength, \( V_{\text{res}} \), of the connection shall not be less than that determined by Section 21.4.5.1.

21.6.7.10 Wall piers and Wall segments.

21.6.7.10.1 Wall piers designed as a part of a special moment frame shall have transverse reinforcement designed to satisfy the requirements in Section 21.6.7.10.2.

**Exceptions:**

1. Wall piers that satisfy Section 21.911.
2. Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers, and such segments have a total stiffness of at least six times the sum of the stiffness of all the wall piers.

21.6.7.10.2 Transverse reinforcement shall be designed to resist the shear forces determined from Sections 21.3.4.2 and 21.4.5.1. Where the axial compressive force, including earthquake effects, is less than \( A_g f'_c /20 \), transverse reinforcement in wall piers is permitted to have standard hooks at each end in lieu of hoops. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least the development length of the largest longitudinal reinforcement in the wall pier.

21.6.7.10.3 Wall segments with a horizontal length-to-thickness ratio less than \( 2 \frac{1}{2} \), shall be designed as columns.

31. Add new text as follows:

1908.1.4 ACI 318, Section 21.10.1.1 Modify ACI 318 Section 21.10.1.1 to read as follows:

21.10.1.1 Foundations resisting earthquake-induced forces or transferring earthquake-induced forces between structure and ground shall comply with requirements of Section 21.10 and other applicable provisions of ACI 318 unless modified by Chapter 18 of the International Building Code.

32. Revise as follows:

1908.1.445 ACI 318, Section 21.911.2.2 Modify ACI 318 Section 21.911.2.2 to read as follows:

21.911.2.2 Members with factored gravity axial forces exceeding \( A_g f'_c /10 \) shall satisfy Sections 21.4.3.1, 21.4.4.1(c), 21.4.4.3 and 21.4.5. The maximum longitudinal spacing of ties shall be \( s_t \) for the full column height. The spacing \( s_t \) shall not be more than six
33. Revise as follows:

1910.3.1 Ordinary moment frames. In flexural members of ordinary moment frames forming part of the seismic-force-resisting system, at least two main flexural reinforcing bars shall be provided continuously top and bottom throughout the beams, through or developed within exterior columns or boundary elements. Complain: of ordinary moment frames having a clear height to maximum plan dimension ratio of five or less shall be designed for shear in accordance with Section 21.4.12.3 of ACI 318.

34. Revise as follows:

1910.4.2 Discontinuous members. Columns supporting reactions from discontinuous stiff members, such as walls, shall be designed for the special load combinations in Section 1605.4 and shall be provided with transverse reinforcement at the spacing \( s_o \) as defined in Section 21.4.12.5.2 of ACI 318 over their full height beneath the level at which the discontinuity occurs. This transverse reinforcement shall be extended above and below the column as required in Section 21.4.4.5 of ACI 318.

35. Delete without substitution:

1910.4.3 Anchor bolts in the top of columns. Anchor bolts which are set in the top of a column shall be provided with ties which enclose at least four longitudinal column bars. There shall be at least two No. 4 (#13) or three No. 3 (#10) ties within 5 inches of the top of the column. The ties shall have hooks on each free end which comply with Section 7.1.3 (e) of ACI 318.

The strength design of anchors that are not within the scope of Appendix D of ACI 318, and as amended above, shall be in accordance with an approved procedure.

36. Revise as follows:

1910.5.2 Frame members not proportioned to resist forces induced by earthquake motions. Frame components assumed not to contribute to lateral force resistance shall conform to ACI 318, Section 21.9.11, as modified by Section 1908.1.4+4 of this chapter.

37. Revise as follows:

1913.1 Scope. The provisions of this section shall govern the strength design of anchors cast installed in concrete for purposes of transmitting structural loads from one connected element to the other. These provisions apply to headed bolts, headed studs, and hooked (J- or L-) bolts cast in concrete. These provisions do not apply to expansion anchors and undercut anchors installed in hardened concrete, or load applications that are predominantly high cycle fatigue or impact shall be designed in accordance with Appendix D of ACI 318, provided they are within the scope of Appendix D. The headed of headed studs and headed bolts shall have a geometry such that the pullout strength of the anchor in uncracked concrete, as demonstrated by approved tests, equals or exceeds \( 1.4 N_p \) (where \( N_p \) is given by Eq. (1913-11a)). Hooked bolts shall have a geometry such that the pullout strength of the anchor without the benefit of friction in uncracked concrete, as demonstrated by approved tests, equals or exceeds \( 1.4 N_p \) (where \( N_p \) is given by Eq. (1913-11b)). Reinforcement used as part of the embedment shall be designed in accordance with applicable parts of ACI 318.

Exceptions: Where the basic concrete breakout strength in tension of a single anchor, \( N_b \), is determined in accordance with Eq. (D-7), the concrete breakout strength requirements of Section D.4.2.2 shall be considered satisfied by the design procedures of Sections D.5.2 and D.6.2 for anchors exceeding 2 inches in diameter or 25 inches tensile embedment depth.

38. Delete without substitution:

Sections 1913.2 Notations and Definitions through 1913.9 Installation of anchors. (Remainder of Section 1913 ANCHORAGE TO CONCRETE - STRENGTH DESIGN).

39. Revise as follows:

1605.2.1 Basic load combinations. (No change to text.)
forces of ASCE 7, W shall be divided by the directionality factor of 0.85.

2-1. Where other factored load combinations are specifically required by the provisions of this code, such combinations shall take precedence.

40. Revise Chapter 35 referenced standard as follows:

<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI318-99-02</td>
<td>Building Code Requirement</td>
<td>1604.3.2, 1604.3.4, 1605.2.4, Table 1617.6, 1617.6.4.3, Table 1704.3, 1704.4.1, Table 1704.4, 1708.3, 1805.4.2.6, 1805.9, 1807.2.23.2, 1808.2.3.2, 1808.2.3.2.2, 1811.8, 1901.2, 1901.3, 1901.4, 1902, 1903.1, 1903.2, 1903.3, 1903.4, 1903.5.1, 1903.6, 1904.4, 1905.1.4, 1905.3, 1905.4, 1905.5, 1905.6, 1905.7, 1905.8.3, 1905.11.3, 1906.1.5, 1906.3, 1906.4.3, 1907.1, 1907.2, 1907.4.1, 1907.6, 1907.7.2, 1907.7.3, 1907.7.4, 1907.7.5, 1907.8, 1907.9, 1907.10, 1907.11, 1907.12, 1907.13, 1908, 1909.1, 1909.3, 1909.4, 1909.5, 1909.6, 1910.1, 1910.2.1, 1910.2.3, 1910.2.4, 1910.3.1, 1910.4.2, 1910.4.3, 1910.4.4, 1910.4.4.1, 1910.5.3, 1913.1, 1913.2.1, 1913.3.2, 1913.4.4, 1913.4.5, 1913.5.2.7, 2213.1</td>
</tr>
</tbody>
</table>

41. Add new referenced standard to Chapter 35 as follows:

<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI T1.1-01</td>
<td>Acceptance Criteria for Moment Frames Based on Structural Testing</td>
<td>1908.1.2</td>
</tr>
</tbody>
</table>

Proponent's Reason: 1. A new Appendix D has been added to ACI 318-02 on “Anchoring to Concrete.” To make sure anchors are installed in accordance with the design assumptions, they need to be shown on the construction documents. This change to item 3 is consistent with changes made to Section 1.2.1 of ACI 318-02. Reformating of Chapter 21 of ACI 318-02 makes it necessary to change referenced section number in item 11.

2 through 9. Existing definitions are being revised, and new definitions are being added to reflect terminology used in the prestressed concrete industry. The changes are consistent with changes made to Section 2.1 and other section throughout ACI 318-02.

10 and 11. Section 3.2.1(d) of ACI 318-02 permits the use of ASTM C1157 blended cements; therefore, this IBC modification to ACI 318 is no longer needed and is being deleted. While ASTM C 1157 cements have been permitted by the IBC, note “b” to Table 1904.2.3 needs to reflect that pozzolans and slag may be present in some C 1157 blended cements.

12. Section 5.1.1 of ACI 318-02 requires the minimum $f'_c$ to be not less than 2,500 psi; therefore, this IBC requirement is no longer a modification to ACI 318 so the italics is being deleted. The new sentence being added to the end of this section is new to ACI 318-02 and is located in Section 1.1.1 of that document. Since Chapter 1 of ACI 318 is not transcribed into this code, the proposed located is the most appropriate. The sentence was added to the 318 code to explicitly state that Committee 318 intends that there be no upper limit on strength unless a limit is explicitly imposed in the code.

13. Changes made to Section 5.2.3 of ACI 318-02 emphasize field experience or trial mixtures (Section 5.3) as the preferred methods of proportioning concrete mixtures. The suggested revised wording references the appropriate ACI section.

14 through 16. Section 5.6.3.3 of ACI 318-02 to permit an individual strength test (average of two cylinders) of concrete with $f'_c$ greater than 5,000 psi to be as much as 10% below the value of $f'_c$ and still be considered satisfactory. Prior to the 2002 edition, concrete with strengths higher than 5,000 psi were held to the same standard as 2,500 – 5,000 psi concrete, which was unnecessarily conservative. ACI Committee 318 apparently overlooked making necessary correlative changes to Sections 5.6.5.1 and 5.6.5.2 of ACI 318; however, required changes are being suggested to the IBC for consistency and to avoid conflicting requirements.

17. Research has shown that cores drilled from concrete for strength-testing and conditioned as required by previous editions of ACI 318 did not accurately reflect the strength of the in-situ concrete. Therefore, Section 5.6.5.3 of ACI 318-02 has been revised to require conditioning of the cores that should yield test strengths that more closely correlate with the strength of the in-situ concrete. This change will correlate the IBC with ACI 318-02.

18. ACI 318-02 now uses the term “registered design professional” as the IBC does. Therefore, this change is to remove the italics since this is no longer an IBC modification to ACI 318. Note that the second sentence of IBC Section 1907.5.1 is transcribed from Section 16.7.1 of ACI 318. Other changes are for consistency with terminology used in the prestressed concrete industry. See item 2.

19. The changes being made are for consistency between ACI 318-02
and ACI 117 “Standard Specification for Tolerances for Concrete Construction and Materials,” and are consistent with Section 7.5.2.2 of ACI 318-02.

20. The revision to cite Section 1907.7.5 is to draw attention to the fact that additional cover may be required where concrete will be exposed to corrosive environments. Also, see item 11.

21 and 22. The order of Sections 7.7.2 and 7.7.3 of ACI 318-99 have been reversed in the 2002 edition. Other changes are to emphasize that minimum cover requirements also apply to ducts for prestressing steel, and end fittings, and indicate that concrete exposed to corrosive environments needs to have additional cover per Section 7.7.5.

23. The requirements in Section 7.7.5 of ACI 318-02 have been expanded to address additional cover requirements for certain prestressed concrete flexural members exposed to corrosive environments. Since the new provisions reference other ACI 318 provisions that are not transcribed into the IBC, for simplicity it is better to reference ACI 318.

24. Several IBC modifications to ACI 318-99 were considered by ACI Committee 318 and deemed worthy of including in ACI 318; therefore, they have been incorporated into the 2002 edition. This allows some of the modifications to be deleted.

25. Editions of ACI 318 prior to 2002 included an alternate design method (allowable stress design or working stress design) in its Appendix A. Since it was the intent of the seismic design provisions of the IBC to require that design of concrete elements subject to seismic loads be in accordance with strength design procedures, the modification contained in Section 1908.1.1 was necessary. The appendix in question has been deleted from the 2002 edition of ACI 318; therefore, the modification is not necessary.

The load combinations of Section 9.2 of ACI 318-99, and numerous editions prior to that, were based on the premise that all loads required by the building code were service level loads (without a load factor). Since the seismic loads of the IBC are strength-based loads, it was necessary to modify the provisions of ACI 318-99 to indicate that when load combinations included seismic forces or their effects, the strength load combinations of IBC had to be used in lieu of those in ACI 318. The 2002 edition of ACI 318 has incorporated the same load combinations used in the IBC (i.e., those of ASCE 7) into Section 9.2; therefore, this modification is no longer necessary.

This IBC modification to ACI 318 has been incorporated into Section 18.9.3 of ACI 318-02; therefore, it is no longer necessary.

Because several IBC modifications have been incorporated into ACI 318-02, the deleted symbols are now unnecessary.

26. Because several IBC modifications have been incorporated into ACI 318-02, the deleted definitions are now unnecessary.

27. ACI 318-02 now contains provisions for special moment frames constructed of precast concrete elements (Section 21.6), special structural walls constructed using precast concrete elements (Section 21.8), and intermediate precast structural walls (Section 21.13). While the latter systems is restricted to use in buildings assigned to Seismic Design Category (SDC) C or lower, the other two systems can be used in buildings of any SDC. In view of these additions to ACI 318-02, the modifications being deleted have now become unnecessary or inappropriate.

28. These modifications to ACI 318 provisions need to be maintained because these are not incorporated in ACI 318-02. The changes reflect those made from the 1997 to the 2000 edition of the NEHRP Recommended Provisions. Also, “prestressing tendons” has been replaced with “prestressing steel” in a number of locations, in view of similar changes made throughout ACI 318-02.

29. See “reason” for 27 above.

30. Reformatting of Chapter 21 of ACI 318-02 makes it necessary to change referenced section numbers.

31. ACI 318-99 included a new section in Chapter 21 that applies to foundations of structures assigned to SDC D, E or F. Since the requirements in ACI 318 may be in conflict with the provisions of Chapter 18 of the IBC, it is desirable to have a modification calling the user’s attention to the fact that the IBC also has requirements for foundations that may control over those in ACI 318.

32. Reformatting of Chapter 21 of ACI 318-02 makes it necessary to change referenced section numbers. In addition, there is no change to the last sentence from what is in ACI 318; therefore, it should not be italics.

33 and 34. Reformatting of Chapter 21 of ACI 318-02 makes it necessary to change referenced section numbers.

35. Except as indicated below, provisions identical to these have been incorporated into Section 7.10.5.6 of ACI 318-02. They differ in two respects. First, placement of the provisions in ACI 318 means they apply to all structures, not just those assigned to SDC C and higher. Second, Committee 318 did not feel that it was necessary to require the free end of ties to terminate with 135 degree hooks as required by the IBC’s citation of ACI 318 Section 7.1.9(c). This means a standard 90-degree hook is acceptable.

36. Reformatting of Chapter 21 of ACI 318-02 and deletion of some modifications in Section 1908.1 make it necessary to change referenced section numbers.

37 and 38. Section 1913 of the IBC consists of provisions that have been under development within ACI Committee 318 for a period of several years. During the development of the IBC, ACI agreed to let the IBC transcribe their copyrighted material as it stood at that time, until Committee 318 could complete the work and incorporate the provisions for anchoring to concrete into ACI 318. It was understood that once the material was incorporated into ACI 318, the provisions in the IBC would be deleted, and the provisions in ACI 318 referenced. The 2002 edition of ACI 318 has almost identical provisions in Appendix D. In addition, the provisions also apply to expansion anchors and undercut anchors installed in hardened concrete. Therefore, the material now in ACI 318-02 is being deleted from the IBC, and is being replaced with a reference to ACI 318.

As currently written, Section D.4.2.2 of ACI 318-02 prohibits the use of anchor bolts greater than 2 inches in diameter or 25 inches in tensile embedment depth unless testing is performed. Laboratory testing used to establish the anchor bolt design criteria of Appendix D of ACI 318-02 indicates that if Eq. (D-7) is used, the limitations regarding anchor bolt diameter and tensile embedment depth can be ignored.

39. The load combinations of Section 9.2 of ACI 318-02 are identical to those of IBC Section 1605.2.1; therefore, this exception is no longer necessary.

40 and 41. To update the references to ACI 318 in Chapter 35 to the 2002 edition of the standard, and to add a new ACI standard that is being referenced in Chapter 19.

Analysis: A review of ACI T1.1 indicates compliance with Section 3.6 of the ICC code development process.

Committee Action: Approved as Modified
Modify item 20 of proposal as follows:

1907.7.1 Cast-in-place concrete (nonprestressed). Minimum concrete cover shall be provided for reinforcement in nonprestressed, cast-in-place concrete construction in accordance with Table 1907.7.1, but shall not be less than required by Sections 1907.7.5 and 1907.7.7.

Modify item 36 of proposal as follows:

1910.5.2 Frame members not proportioned to resist forces induced by earthquake motions. Frame components assumed not to contribute to lateral force resistance shall conform to ACI 318, Section 21.11, as modified by Section 1908.1.4 of this chapter.

Items 1 - 19, 21 - 35, & 37 -41 approved as proposed.

Committee Reason: Based on proponent’s published reason. The modifications are editorial.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Michael J. Lynch, Illinois Tool Works Inc.; representing ITW Ramset/Red Head, requests Approved as Modified by this comment.

Modify proposal as follows:

Disapprove items 37 and 38.

Items 1 through 36 and 39 through 41 as previously approved.

Commenter’s Reason: Point 37: 1913.1, as amended, adopts the provisions of Appendix D of ACI 318 which, in turn, references ACI 355.2. Neither “standard” meets the ICC’s requirements for acceptance into the IBC as stipulated by Section 3.6.3, et al of the ICC Regulations. Point 38 repeals current sections of the IBC.

In his October 4, 2000 letter to Samuel Bleicher, Esq., in reply to matters raised in Illinois Tool Works Inc. v. ACI International, et al [Case No. 1:00CV02179], Mr. Tangye, as President of the ICC, made two points of relevance to our opposition to the adoption S 115-02, points 37 [1913.1] and 38:

1. “Under the ICC Regulations, Section 3.6.3, a standard cannot be considered for inclusion in the IBC unless it has been developed and maintained through a consensus process such as ASTM or the organization or the committee methods of the American national Standards Institute(ANSI). ... To my knowledge, ANSI does not recognize “provisional” standards; i.e., standards that are made effective before the full consensus process, including final disposition of any pending appeals before internal bodies of the standards organization, has been completed. Whatever ANSI’s position, ICC Regulations do not recognize “provisional” standards as consensus standards under the ICC, and ICC will not consider a “standard” as a consensus standard until all internal and external procedures and appeals are exhausted, including appeals to ANSI.”

With reference to the above, we wish to cite a letter to this writer by Ms. Amy A. Marasco, Vice President and General Counsel to the American National Standards Institute. In her letter of May 29, 2002, Ms. Marasco states:

"Accreditation by the ANSI Executive Standards Council(ExCS) as a developer of American National Standards(ANS) relates to the procedures used by the standards developer in connection with American National Standards only[emphasis added]. ... ANSI has ‘jurisdiction’ only over the processes that relate to the development and approval as American National Standards. Accreditation does not address or encompass a standards developer’s other activities or business interests, including those that relate to standardization activities outside of the ANSI process.” Further, she states:

“Once a standards developer’s procedures are accredited by ANSI, that developer can so characterize their procedures publicly. They cannot [emphasis added], however, state that any standard that is developed as a result of the implementation of those procedures (or any other procedure that the developer may chose to use) is an American National Standard.”

The points made by Ms. Maracuso in her letter of May 29 reflect those presented last year to the House Subcommittee on Environment, Technology and Standards in response to a question from the Chair, the Hon. Vern Ehlers.

ITW believes, and has repeatedly cited in appeals to the American Concrete Institute (ACI) by a member of its 355 Committee and in its own comments, that ACI did not follow its own procedures, including the resolution of negatives (nearly all of which are still unresolved); that the processes used to create both ACI 318-D and 355.2 were neither transparent nor consensus; and the adoption of S 115-02 will create a situation whereby bodies such as FEMA, ICBO, and ICC will adopt these flawed changes to the detriment of U.S. post-installed anchor producers and their customers. The fact that we are commenting on S 115-02 is proof of our case. Also, since ACI has not offered either 318-D or 355.2 as an American National Standard, ANSI has no obligation to hear either ITW’s comments on this matter nor an appeal of the ACI process, as permitted normally by ANSI’s rules. Also, if the proponents of the aforementioned ACI standards have submitted these standards to ASTM, ASTM’s process is far from complete. Hence, ACI 318-D and ACI 355.2 are not, in our opinion, consensus standards under the ICC Regulations and cannot be considered for inclusion in the IBC at this time.

Mr. Tangye’s letter also states the following:

2. “ICC Regulations prohibit the adoption of standards into the IBC that would have the effect of requiring the use of a patented or other proprietary material. Under ICC Regulations, a standard may not be incorporated into the IBC if it has the effect of requiring patented [or] proprietary materials.”

An ITW employee, Mr. Richard Ernst, was invited to join the ACI 355 Committee in 1997, near the outset of its deliberations to develop a test method for the use of post-installed anchors in cracked concrete. Mr. Ernst has no recollection whatsoever that any member of the Committee ever disclosed its patent interests to the Committee’s members, either collectively or individually. It was not until August,
2000 that ITW discovered that the employer of the Committee’s chairman had already been granted over two dozen patents both in the U.S. and Europe for products that could pass a test first adopted in Europe and then used as the basis for ACI 355.2. Mr. Ernst and ITW brought this matter to the attention of ACI and ICBO in its appeals and public comments; but were summarily dismissed.

Of the U.S.-based post installed anchor producers, none, to the best of our knowledge, has been able to successfully engineer a compliant post-installed anchor without impinging on the aforementioned employer’s patents. Further, no U.S.-based laboratory, to the best of our knowledge, is either capable of or certified to run the prescribed ACI 355.2 tests. Finally, though proponents of ACI 318-D and 355.2 argue that these documents apply only to the installation of mechanical anchors in cracked concrete conditions, we believe, based on nearly 100 years of experience, that market behavior will automatically turn to comply with the provisions of S 115-02, once adopted by the ICC into the IBC. Hence, not only will U.S.-based anchor producers be placed in an inescapable disadvantage, post-installed drop-in anchors, nearly all of which are imported in the U.S., will face non-tariff barriers in the form ACI 318-D and 355.2, as well as S 115-02, if adopted.

S117-02
1908.1.5, 1908.1.12

Proposed Change as Submitted:

Proponent: David R. Bonneville, SE, representing NCSEA Seismic Committee

1. Add new definition as follows:

1908.1.5 ACI 318, Section 21.1 Modify existing definitions and add the following definitions to ACI 318, Section 21.1.

STORY DRIFT RATIO. The design displacement over a story divided by the story height.

No change to remaining definitions.

2. Delete and substitute as follows:

1908.1.12 (Supp) ACI 318, Sections 21.9.2.1 and 21.9.3.2. Modify ACI 318 Sections 21.9.2.1 and 21.9.3.2 to read as follows:

21.9.2.1 Members with factored gravity axial forces not exceeding \( A_f' / 10 \) shall satisfy 21.3.2.1 and 21.3.4. Stirrups shall be spaced not more than \( d/2 \) throughout the length of the member. Stirrups need not be provided in two-way slabs with column line beams that are the same thickness as the slab itself. Shear reinforcement shall be provided where required.

21.9.3.2 Members with factored gravity axial forces exceeding \( A_f' / 10 \) shall satisfy 21.3.2.1 and 21.3.4. Stirrups shall be spaced not more than \( d/2 \) throughout the length of the member. Stirrups need not be provided in two-way slabs with column line beams that are the same thickness as the slab itself. Shear reinforcement shall be provided where required.

1908.1.12 ACI 318, Section 21.9.1 Modify ACI 318, Section 21.9.1 to read as follows:

21.9.1 Frame members assumed not to contribute to lateral resistance shall be detailed according to 21.9.2 or 21.9.3 depending on the magnitude of moments induced in those members when subjected to the design displacement. If effects of design displacements are not explicitly checked, it shall be permitted to apply the requirements of 21.9.3. Slab-column connections shall comply with 21.9.4 through 21.9.6.

3. Add new text as follows:

1908.1.13 ACI 318, Section 21.9 Add new Sections 21.9.4, 21.9.5, 21.9.6 to ACI 318, Section 21.9 to read as follows:

21.9.4 Reinforcement to resist punching shear shall be provided in accordance with 11.12, 21.9.4.1 and 21.9.4.2 at slab column connections where story drift ratio exceeds \([0.035 – 0.05 \times (V_u / V_c)]\). Shear reinforcement need not be provided where \( V_u / V_c \) is less than 0.2 or where story drift ratio is less than 0.005, except as is required in 11.12 for gravity loads without consideration of seismic effects. \( V_c \) equals the factored punching shear from gravity load excluding shear stress from unbalanced moment. \( V_u \) is calculated for the load combination \( 1.2D + 1.0L + 0.2S \). The load factor on \( L \) is permitted to be reduced to 0.5 in accordance with 9.2.1(a).

21.9.4.1 – The slab shear reinforcement shall provide \( V_s \) not less than \( 3.5 f'c \).

21.9.4.2 – Slab shear reinforcement shall extend not less than 5 times the slab thickness from the face of column.

21.9.5 – Bottom bars or wires within the column strip shall conform to 13.3.8.5 except that splices shall be Class B.

21.9.6 – Within the effective slab width defined in 13.5.3.2, the ratio of non-prestressed bottom reinforcement to gross concrete area shall not be less than 0.004.

Proponent’s Reason: This proposal applies to high seismic areas. It aims to prevent punching shear failures that can occur around columns in flat slabs in buildings subjected to earthquake deformations. Such
punching shear failures resulted in un-repairable earthquake damage in the Northridge earthquake and could lead to slab collapse in cases where integrity reinforcements is insufficient.

This proposal replaces a similar proposal that passed last year at the IBC public hearings for the 2002 Supplement but later failed at the annual meetings of the model codes. That proposal provided the desired protection against punching shear, but was unnecessarily restrictive for stiff buildings such as low- to mid-rise concrete wall buildings. This proposal is based on test results of loaded slabs subjected to lateral displacements. It considers the interaction between shear stress and story drift and requires shear reinforcement for conditions in which their combined effect could result in punching shear failure. The proposal was developed after extensive discussion and review with experience engineers who design concrete structures for earthquake effects.

The modifications to ACI Section 21.9.2.1 and 21.9.3.2 remove the 2002 IBC provisions that are being replaced.

The modification to ACI Section 21.9.1 identifies the applicability of the new sections that are being added.

The addition of ACI Section 21.9.4 defines the criteria under which slab shear reinforcement is required, based on gravity load shear stress and story drift. Section 21.9.4.1 defines the quantity of shear reinforcement required, and Section 21.9.4.2 defines the length over which the shear reinforcement shall extend.

The addition of ACI Section 21.9.5 requires Class B rather than Class A lap splices for critical slab bottom bars that may yield as a result of seismic deformation.

The addition of ACI Section 21.9.6 provides minimum bottom reinforcement in the region near the column that may yield as a result of seismic deformation.

**Cost Impact:** Compared to minimum designs according to the 2000 IBC, this proposal would increase the use of shear reinforcement in flat slab construction in high seismic areas for tall or flexible buildings that undergo substantial seismic deformation, resulting in a small increase in construction cost. Compared to the 2002 IBC, the proposal would decrease the use of such shear reinforcement in low rise and stiff mid-rise buildings, resulting in cost savings.

**Committee Action:** Approved as Modified

**Modify item 2 of proposal as follows:**

1908.1.12 ACI 318, Section 21.9.1 Modify ACI 318, Section 21.9 .1 to read as follows:

21.9.1 Frame members assumed not to contribute to lateral resistance shall be detailed according to 21.9.2 or 21.9.3 depending on the magnitude of moments induced in those members when subjected to the design displacement. If effects of design displacements are not explicitly checked, it shall be permitted to apply the requirements of 21.9.3. Slab-column connections shall comply with 21.9.4 through 21.9.6. Conformance to 21.9 satisfies the deformation compatibility requirements of Section 1617.6.4.3.

**Modify item 3 of proposal as follows:**

1908.1.13 ACI 318, Section 21.9 Add new Sections 21.9.4, 21.9.5, 21.9.6 to ACI 318, Section 21.9 to read as follows:

21.9.4 Reinforcement to resist punching shear shall be provided in accordance with 11.12, 21.9.4.1 and 21.9.4.2 at slab column connections where story drift ratio exceeds 0.035 – 0.05 (V_u / V_c). Otherwise, shear reinforcement need not be provided where V_u – V_c is less than 0.2 or where story drift ratio is less than 0.005, except as is required in 11.12 for gravity loads without consideration of seismic effects. V_u equals the factored punching shear from gravity load excluding shear stress from unbalanced moment. V_c is calculated for the load combination 1.2D + 1.0L + 0.2S. The load factor on L is permitted to be reduced to 0.5 in accordance with 9.2.1(a).

21.9.4.1 – The slab shear reinforcement shall provide V_u not less than 3.5 f_c

21.9.4.2 – Slab shear reinforcement shall extend not less than 5 times the slab thickness from the face of column.

21.9.5 – Bottom bars or wires within the column strip shall conform to 13.3.8.5 except that splices shall be Class B.

21.9.6 – Within the effective slab width defined in 13.5.3.2, the ratio of non-prestressed bottom reinforcement to gross concrete area shall not be less than 0.004. Where bottom reinforcement is not required to be continuous, such reinforcement shall extend a minimum of 5 times the slab thickness plus one development length beyond the face of the column or terminated at the slab edge with a standard hook.

Add new item 4 as follows:

1617.6.4.3 Deformational compatibility. (no change to text)

Exception: Reinforced concrete frame members not designed as part of the seismic-force-resisting system and slabs shall comply with Section 21.9 of ACI 318.

**Item 1 approved as proposed.**

**Committee Reason:** Based on proponent’s published reason. The modification of item 2 and additional item 4 are meant to clarify that conformance with these prescriptive slab reinforcing requirements will satisfy deformation compatibility requirements for slabs that are part of gravity frames only. The modification to 21.9.4 (item 3) improves the clarity of the proposed language. The modification to 21.9.6 (item 3) addresses post-tensioned slabs in which continuous bottom reinforcement would normally not be required by prescribing a minimum extension beyond the column face for the prescriptive bottom reinforcement.

**Staff note:** If code change S43-02 is ultimately approved, the change in item 4 will be reflected as a modification to the corresponding section of ASCE 7.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment 1:**

Michael Valley; representing the Structural Engineers Association of Washington, John Hooper; 2002 International Building Code Structural Committee, David Bonneville; representing the NCSEA Seismic Committee, S.K. Ghosh; representing the Portland Cement Association, and Joe Maffei; representing the
21.9.4 Reinforcement to resist punching shear shall be provided in accordance with 21.9.4.1 and 21.9.4.2 at slab-column connections where story drift ratio exceeds \(0.035\times(V_u/V_c)\) and \(0.05(V_u/V_c)\) except that 21.9.4.1 and 21.9.4.2 need not be satisfied where \(V_u/V_c\) is less than 0.2, or where the story drift ratio is less than 0.005. Otherwise, shear reinforcement need not be provided, except as required in 11.12 for gravity loads without consideration of seismic effects. \(V_u\) equals the factored punching shear from gravity load excluding shear stress from unbalanced moment. \(V_c\) is calculated for the load combination \(1.2D + 1.0L + 0.2S\). The load factor on \(L\) is permitted to be reduced to 0.5 in accordance with 9.2.1(a). In no case shall shear reinforcement be less than that required in 11.12 for loads without consideration of seismic effects.

_items 1, 2 & 4 as previously approved.

**Public Comment 2:**

Chris V. Tokas, Structural Engineers Association of California; representing SEAOC Seismology Committee, requests Approved as Modified by this comment.

Modify item 3 of proposal as follows:

Add new Sections 21.9.4, 21.9.5, 21.9.6 to ACI 318, Section 21.9 to read as follows:

21.9.4 Reinforcement to resist punching shear shall be provided in accordance with 21.9.4.1 and 21.9.4.2 at slab-column connections where story drift ratio exceeds \(0.035\times(V_u/V_c)\); except that 21.9.4.1 and 21.9.4.2 need not be satisfied where \(V_u/V_c\) is less than 0.2, or where the story drift ratio is less than 0.005. Otherwise, shear reinforcement need not be provided, except as required in 11.12 for gravity loads without consideration of seismic effects. \(V_u\) equals the factored punching shear from gravity load excluding shear stress from unbalanced moment. \(V_c\) is calculated for the load combination \(1.2D + 1.0L + 0.2S\). The load factor on \(L\) is permitted to be reduced to 0.5 in accordance with 9.2.1(a). In no case shall shear reinforcement be less than that required in 11.12 for loads without consideration of seismic effects.

_items 1, 2 & 4 as previously approved.

**Proposed Change as Submitted:**

**Proponent:** Joseph J. Messersmith Jr., Portland Cement Association and Dan Falconer, American Concrete Institute

**Revise as follows:**

1. **1910.2.4 Special reinforced concrete shear walls.**

   Special reinforced concrete shear walls are walls conforming to the requirements of ACI 318 for special reinforced concrete structural walls or special precast structural walls.

2. **1910.4.1 Seismic-force-resisting systems.**

   Moment frames used to resist seismic forces shall be intermediate moment frames or special moment frames. Shear walls used to resist seismic forces shall be ordinary reinforced concrete shear walls, or special reinforced concrete shear walls. Ordinary reinforced concrete shear walls constructed of precast concrete elements shall comply with the additional requirements of Section 21.13 of ACI 318 for intermediate precast concrete structural walls.

**Proponent’s Reason:** ACI 318-02 has new provisions for designing and constructing shear walls with precast concrete elements. These walls are categorized by ACI 318 as intermediate precast structural walls (IPSW), and special precast structural walls (SPSW).
provisions of Chapters 1 through 18 of ACI 318 apply.

The only difference between an ORCSW constructed with precast elements for use in a structure assigned to SDC A or B, and an IPSW for use in a structure assigned to SDC C, is that Section 21.13 of ACI 318-02 has special provisions for connections between individual panels, and between panels and the foundation. The panels themselves are designed as an ORCSW. In order to simplify integrating the IPSW system into the IBC, it is simpler to refer to it as an ORCSW and specify that were used in a structure assigned to SDC C, the provisions of Section 21.13 of ACI 318 shall also apply. This is being proposed in Section 1910.4.1.

The new provisions for SPSW in ACI 318 are intended to be implemented in structures assigned to SDC D, E or F, as is now required for CIP concrete walls which must comply with ACI 318 for a special reinforced concrete structural wall (SRCSW). Therefore, Section 1910.2.4 is being modified to indicate that a special reinforced concrete shear wall can either be constructed of CIP concrete, referred to in ACI 318 as a SRCSW, or of precast elements in which case the wall is referred to in ACI 318 as a SPSW.

Committee Action: Approved as Modified

Modify item 2 of proposal as follows:

1910.4.1 Seismic-force-resisting systems. Moment frames used to resist seismic forces shall be intermediate moment frames or special moment frames. Shear walls used to resist seismic forces shall be ordinary reinforced concrete shear walls, or special reinforced concrete shear walls. Ordinary reinforced concrete shear walls constructed of precast concrete elements shall comply with the additional requirements of Section 21.13 of ACI 318 for intermediate precast concrete structural walls, as modified by Section 1908.1.13.4.

Add new item 3 as follows:

1908.1.13 ACI 318, Section 21.13.2. Modify ACI 318, Section 21.13.2 to read as follows:

21.13.2 In connections between wall panels, or between wall panels and the foundation, yielding shall be restricted to reinforcement.

Item 1 approved as proposed.

Committee Reason: Based on proponent’s published reason. The modification added in item 3 and cross-referenced in item 2 limits yielding to the reinforcing steel in connections between intermediate precast concrete wall panels by deleting the phrase “steel elements” from the ACI 318-02 provision.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment: Joseph J. Messersmith, Jr., Portland Cement Association, requests Approved as Modified.

Modify item 1 of proposal as follows:

1910.2.4 Special reinforced concrete shear walls. Special reinforced concrete shear walls are walls conforming to the requirements of ACI 318 for special reinforced concrete structural walls or special precast structural walls. Special precast structural walls shall comply with Section 21.8 of ACI 318, as modified by Section 1908.1.4.

Modify item 2 of proposal as follows:

1910.4.1 Seismic-force-resisting systems. Moment frames used to resist seismic forces shall be intermediate moment frames or special moment frames. Shear walls used to resist seismic forces shall be ordinary reinforced concrete shear walls, or special reinforced concrete shear walls. Ordinary reinforced concrete shear walls constructed of precast concrete elements shall comply with the additional requirements of Section 21.13 of ACI 318 for intermediate precast concrete structural walls, as modified by Section 1908.1.13.4.

Modify item 3 of proposal as follows:

1908.1.13 ACI 318, Section 21.13.2. Modify ACI 318, Section 21.13.2 to read as follows and add new Sections 21.8.2 and 21.8.3.

21.13.2 In connections between wall panels, or between wall panels and the foundation, yielding shall be restricted to reinforcement.

21.8.1 Special structural walls constructed using precast concrete shall satisfy all requirements of 21.7 for cast-in-place special structural walls in addition to 21.8.2 and 21.8.3.

21.8.2 In connections between wall panels, or between wall panels and the foundation, yielding shall be restricted to reinforcement.

21.8.3 Elements of the connection that are not designed to yield shall develop at least 1.5S_c.

Commenter’s Reason: The modification made at the Pittsburgh hearings to limit yielding of steel elements to reinforcement will also apply to intermediate precast structural walls covered by Section 21.13 of ACI 318. There is no reason why yielding in steel elements other than the reinforcement should not be allowed in intermediate precast structural walls. The proposed modification would have the restriction apply to special structural walls constructed of precast concrete elements only.

S135-02
2106.1

Proposed Change as Submitted:
Proponent: Gerald Jones (CRSC Chair) and Daniel Shapiro (Technical Subcommittee on Masonry Structure Design Requirements Chair); representing Building Seismic Safety Council (BSSC) Code Resource Support Committee

Revise as follows:

2106.1 Seismic design requirements for masonry. Masonry structures and components shall comply with the requirements in Section 2106.1.1, 2106.2, 2106.3, 2106.4, 2106.5 or 2106.6 depending on the structure’s seismic design category as defined in Section 1613.3, except that masonry structures designed by the working stress design method shall be permitted to comply with Section 2106.1.2. All masonry walls, unless isolated on three edges from in-plane motion of the basic structural systems, shall be considered to be part of the seismic-force-resisting system.

Proponent's Reason: This code change is based on a revision to the 2000 NEHRP Recommended Provisions.

The proposed language is intended to target nonloadbearing walls which are tied to the lateral force resisting system, and as a result, will be subject to seismic forces. The added language will prevent the incorporation of elements that are incapable of meeting the demands imposed upon them.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Charles Clark, AIA, P.E., National Concrete Masonry Association (NCMA); representing Masonry Alliance for Codes and Standards (MACS), requests Disapproved.

Commenter's Reason: This proposal alters provisions in ACI 530/ASCE 5/TMS 402, the national consensus standard for masonry design. Specifically, it will require all masonry partition walls to be isolated whereas Paragraph 1.13.5.2.2 of the masonry consensus standard dictates that this be done for walls constructed in Seismic Design Category C or higher.

Moreover, this proposal is more stringent than the most up-to-date seismic provisions referenced in the code - the ASCE 7-02 provisions.

When code change S30-02 is approved, the ASCE 7-02 seismic provisions can be referenced in lieu of the seismic provisions of IBC Chapter 16. ASCE 7-02 requires no special treatment of masonry partition walls built in Seismic Design Categories A or B. In Seismic Design Category C and above, ACI 530/ASCE 5/TMS 402 requires masonry partition walls to be isolated from the adjacent structure to avoid imparting any seismic load to the walls from the structure and vice versa during an earthquake.

Masonry partitions in Seismic Design Categories A and B should not be required to be isolated. Failures attributed to these walls in lower seismic areas are minimal. These areas have a low seismic risk with minimal seismic forces. There are no problems that we are aware of regarding masonry partition walls located in these areas. Limited cracking may occur within these masonry partition walls as well as with other building materials during an earthquake. This is normal and to be expected.

The proposal should be disapproved for these reasons.

S142-02
2106.3.2, 2106.4.1.2

Proposed Change as Submitted:

Proponent: Gerald Jones (CRSC Chair) and Daniel Shapiro (Technical Subcommittee on Masonry Structure Design Requirements Chair); representing Building Seismic Safety Council (BSSC) Code Resource Support Committee

Revise as follows:

1. 2106.3.2 Masonry walls not part of the lateral-force-resisting system. Masonry partition walls, masonry screen walls, and other masonry elements that are not designed to resist vertical or lateral loads, other than those induced by their own mass, shall be isolated from the structure so that the vertical and lateral forces are not imparted to these elements. Isolation joints and connectors between these elements and the structure shall be designed to accommodate the design story drift.

2. 2106.4.1.2 Masonry partition walls. Masonry partition walls, masonry screen walls, and other masonry elements that are not designed to resist vertical or lateral loads, other than those induced by their own mass, shall be isolated from the structure so that vertical and lateral forces are not imparted to these elements. Isolation joints and connectors between these elements and the structure shall be designed to accommodate the design story drift.
**2109.1.1 (Supp) Limitations:** Empirical masonry design shall not be utilized for any of the following conditions:

1. The design or construction of masonry in buildings assigned to Seismic Design Category D, E or F as specified in Section 1616, and the design of the lateral force-resisting system for buildings assigned to Seismic Design Category B or C.

2. The design or construction of masonry structures located in areas where the 3-second gust wind speed from Figure 1609 exceeds 110 mph (145 km/hr). Elements where the applicable design wind pressure exceeds 25 psf.

3. Buildings more than 35 feet (10 668 mm) in height which have masonry wall lateral-force-resisting systems. In buildings that exceed one or more of the above limitations, masonry shall be designed in accordance with the engineered design provisions of Sections 2107 or 2108, or the foundation wall provisions of Section 1805.5.

**Proposed Change as Submitted:**

**Proponent:** Stephanie J. Young, P.E., National Council of Structural Engineers Associations (NCSEA); representing NCSEA Code Advisory Committee – General Engineering Subcommittee.

**Proposed Change as Submitted:**

**Proponent’s Reason:** The restriction on the use of empirical design is too loose in the area of wind loads. The limitation to a wind speed means nothing without defining the exposure, topography, and the height on the building at which the masonry occurs. All of those factors effect the wind load the masonry will experience at that wind speed. It is better to limit its use to a design wind pressure of 25 psf as it was in SBC and BOCA.

**Committee Action:** Approved as Submitted

**Committee Reason:** Based on proponent’s published reason.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because public comments were submitted.

**Public Comment 1:**

Waseem Khan, Brick Industry Association (BIA); representing Masonry Alliance for Codes and Standards (MACS), requests Approved as Modified by this comment.
Modify current text as follows:

2109.1.1 (Supp) Limitations: Empirical masonry design shall not be utilized for any of the following conditions:

1. The design or construction of masonry in buildings assigned to Seismic Design Category D, E or F as specified in Section 1616, and the design of the lateral force-resisting system for buildings assigned to Seismic Design Category B or C.
2. The design or construction of masonry structures located in areas where the 3-second gust wind speed from Figure 1609 exceeds 110 mph (145 km/hr).
3. Buildings more than 35 feet (1068 mm) in height which have masonry wall lateral-force-resisting systems.

In buildings that exceed one or more of the above limitations, masonry shall be designed in accordance with the engineered design provisions of Sections 2107 or 2108, or the foundation wall provisions of Section 1805.5.

Commenter’s Reason: One of the primary reasons for using a basic wind speed as the criteria for empirical masonry design is to make the review of the design by the building official as easy and uncomplicated as possible. Building officials should be very familiar with the basic wind speed for their particular jurisdiction. This number can be easily verified by the reviewer and should make their task easy to perform. It was for this reason that the IBC Draft Structural Committee requested and approved the basic wind speed that was incorporated into the 2000 IBC. If this code change is accepted as submitted, it will undo the intent of the IBC Draft Structural Committee.

The 2002 IBC Structural Committee’s primary reason for recommending approval as submitted was that they were concerned with exceeding a wind pressure of 25 psf. While the majority of buildings located in areas with 110 mph basic wind speed will achieve a wind pressure less than 25 psf, there are a limited number of cases where this is exceeded. However, if the basic wind speed is lowered to 100 mph, most of these cases are dealt with.

For example, if the worst case wind pressure on a standard building measuring 100 feet by 50 feet located in the IBC default exposure (Exposure B) is calculated according to IBC Table 1609.6.2.1(2) for 100 mph basic wind speed, a wind pressure of 20.3 psf results for a building with a mean roof height of 30 feet. Keep in mind that this is for the worst case zone at the end of the wall. If the multiplier of 1.22 in IBC Table 1609.6.2.1(4) for a 60 foot mean roof height is multiplied by this wind pressure, the resulting wind pressure is 24.8 psf. Both of these pressures are less than 25 psf.

For the reasons stated, the proposal should be approved as modified by this public comment.

Public Comment 2:

Phillip Samblanet, The Masonry Society, requests Disapproved.

Commenter’s Reason: ACI 530/ASCE 5/TMS 402 (Building Code Requirements for Masonry Structures) historically limited the use of empirical design to geographical locations where the basic wind speed resulted in a “basic wind pressure” less than or equal to 25 psf. For the first edition (1988) of this standard, ANSI A 58.1 was referenced for wind design. The wind calculations in ANSI A 58.1 produced a basic wind pressure of 25 psf when the average fastest mile wind speed was 90 mph at a level of 30 feet above the ground. This historical limit for empirical design of 25 psf or 90 mph was adopted by most model building codes of the time including the BOCA National Building Code and the Standard Building Code.

During the development of ASCE 7, changes in wind load calculations were needed, but once those changes were made it was no longer easily apparent where empirical design was limited (changing in terms from basic wind pressure to velocity wind pressure to design pressure made designers questions if the limit of 25 psf was with or without various wind factors). Designers also noted that because the wind pressure can vary for different parts of the same building, some areas may be able to be empirically designed while others could not. Recognizing this confusion, and wanting an easily enforceable limit, the IBC Structural Subcommittee requested that the masonry design and construction community develop an appropriate wind limit for the use of empirical design. That basic wind speed limit of 110 mph was selected to limit empirical design based on a comparison of the original fastest-mile wind speed map for the 90 mph contour to the more current 3-second gust maps included in the IBC and ASCE 7. With this limit, the enforcement of empirical design is now consistent to historical limits, but more importantly easily enforceable and applicable to an entire structure, rather than portions of the structure.

Because of the wisdom of this IBC 2000 provision, the Masonry Standards Joint Committee, which is responsible for the ACI 530/ASCE 5/TMS 402, balloted a similar change through the committee. This change was accepted and is now a part of the 2002 edition of the ACI 530/ASCE 5/TMS 402 (Section 5.1.2.2).

Proposed Change S155-02 reinstates the 25 psf limit that has caused confusion in regards to application and enforcement. This confusion will now be more extensive since IBC Section 2101.2.3 permits either the empirical provisions of the ACI 530/ASCE 5/TMS 402 or IBC Section 2109 to be used. This change would make these provisions different in regards to the limits placed on empirical design (S 155 would change the IBC to 25 psf, while the ACI 530/ASCE 5/TMS 402 was just updated to be consistent with the 110 mph in the IBC 2000).

Finally, the term “design wind pressure” applies to both the Main Wind Force Resisting System (ASCE 7-98 (and ASCE 7-02) Section 6.5.12.2) and Components and Cladding (ASCE 7-98 (and ASCE 7-02) Section 6.5.12.4). However because the design wind pressure will obviously be quite different for the Main Wind Force Resisting System than for the Components and Cladding, this change could permit the Main Wind Force Resisting System to be empirically designed even though the Components and Cladding may have to be designed by a more rational method. This is inappropriate.

Because of these reasons, accepting S 155-02 is unwise and unneeded. The masonry consensus standard ACI 530/ASCE 5/TMS 402 has considered this issue carefully, and agreed with the IBC 2000. Changing the provisions back to 25 psf creates unneeded confusion, and difficult enforcement of the empirical limits on masonry buildings. Therefore it is recommended that S 155-02 be disapproved and that the current IBC language be maintained.

S165-02

2303.2, R602.1.3

Proposed Change as Submitted:
Proponent: Joseph T. Holland, III, Hoover Treated Wood Products

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IBC 2303.2 (Supp) Fire-retardant-treated wood.

Fire-retardant-treated wood is any wood product which, when impregnated with chemical by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.

2303.2.1 Labeling. Fire-retardant lumber and wood structural panels shall bear the identification mark of an approved agency in accordance with Section 1703.5. Such identification marks shall indicate conformance with appropriate standards in accordance with Section 2303.2.2 through 2303.2.5.

1. The identification mark of an approved agency in accordance with Section 1703.5.
2. Identification of the treating manufacturer.
3. The name of the fire-retardant treatment.
4. The species of wood treated.
5. Flame spread and smoke developed rating.
7. Conformance with appropriate standards in accordance with Sections 2303.2.2 through 2303.2.5.
8. The words “No increase in the listed classification when subjected to the Standard Rain Test” (ASTM D2898) for FRTW exposed to weather, damp or wet locations.

2303.2.2 Strength adjustments. Design values for untreated lumber and wood structural panels, as specified in Section 2303.1, shall be adjusted for fire-retardant-treated wood. Adjustments to design values shall be based on an approved method of investigation that takes into consideration the effects of the anticipated temperature and humidity to which the fire-retardant-treated wood will be subjected, the type of treatment and redrying procedures.

2. IRC R802.1.3 (Supp) Fire-retardant treated wood.

(No change to text.)
R802.1.3.1 (Supp) Labeling.  Fire-retardant treated lumber and wood structural panels shall bear the identification mark of an approved agency be labeled. The label shall contain:
1. The identification mark of an approved agency in accordance with Section 1703.5 of the International Building Code.
2. Identification of the treating manufacturer.
3. The name of the fire-retardant treatment.
4. The species of wood treated.
5. Flame spread and smoke developed rating.
7. Such identification marks shall indicate conformance with appropriate standards in accordance with Sections R802.1.3.2 through R802.1.3.5.
8. The words “No increase in the listed classification when subjected to the Standard Rain Test” (ASTM D2898) for FRTW exposed to weather, damp or wet locations.

R802.1.3.2 (Supp) Strength adjustments.  Design values for untreated lumber and wood structural panels as specified in Section R802.1, shall be adjusted for fire-retardant-treated wood.  Adjustments to design values shall be based upon an approved method of investigation which takes into consideration the effects of the anticipated temperature and humidity to which the fire-retardant-treated wood will be subjected, the type of treatment and redrying procedures.

R802.1.3.2.1 Wood Structural Panels.  The effect of treatment and the method of redrying after treatment, and exposure to high temperatures and high humidities on the flexure properties of fire-retardant treated softwood plywood shall be determined in accordance with ASTM D 5516.  The test data developed by ASTM D 5516 shall be used to develop adjustment factors, maximum loads and spans, or both for untreated plywood design values in accordance with ASTM D 6305.  Each manufacturer shall publish the allowable maximum loads and spans for service as floor and roof sheathing for their treatment.

R802.1.3.2.2 Lumber.  For each species of wood treated the effect of the treatment and the method of redrying after treatment and exposure to high temperatures and high humidities on the allowable design properties of fire-retardant treated lumber shall be determined in accordance with ASTM D 5664.  The test data developed by ASTM D 5664 shall be used to develop modification factors for use at or near room temperature and at elevated temperatures and humidity in accordance with an approved method of investigation.  Each manufacturer shall publish the modification factors for service at temperatures of 100 F (37.8 C) and for roof framing. The roof framing modification factors shall take into consideration the climatological location.

R802.1.3.3 Exposure to weather, damp or wet locations.  Where fire-retardant treated wood is exposed to weather, or damp or wet locations, it shall be identified as “Exterior” to indicate there is no increase in the listed flame spread index as defined in Section R802.1.3 when subjected to ASTM D 2898.

R802.1.3.4 Interior applications.  Where interior fire-retardant treated wood is exposed to humid interior conditions, it shall be identified as “Interior Type A” to indicate the treated wood has shall have a moisture content of not over 28 percent when tested in accordance with ASTM D 3201 procedures at 92 percent relative humidity.  Interior fire-retardant treated wood shall be tested in accordance with Section R802.1.3.2.1 or R802.1.3.2.2.

R802.1.3.5 Moisture content.  Fire-retardant-treated wood shall be dried to a moisture content of 19 percent or less for lumber and 15 percent or less for wood structural panels before use.  For wood kiln dried after treatment (KDAT) the kiln temperatures shall not exceed those used in kiln drying the lumber and plywood submitted for the tests described in Section R802.1.3.2.1 for plywood and R802.1.3.2.2 for lumber.
3. IBC Add new referenced standards to Chapter 35 as follows:

<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D 5516-99a</td>
<td>Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to The Elevated Temperatures</td>
<td>2303.2.2.1</td>
</tr>
<tr>
<td>ASTM D 5664-01</td>
<td>Standard Test Method of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire Treated Lumber</td>
<td>2303.2.2.2</td>
</tr>
<tr>
<td>ASTM D 6305-98e1</td>
<td>Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing</td>
<td>2303.2.1.3.2.1</td>
</tr>
</tbody>
</table>

4. IRC Add new referenced standards to Chapter 43 as follows:

<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D 5516-99a</td>
<td>Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to The Elevated Temperatures</td>
<td>R802.1.3.2.1</td>
</tr>
<tr>
<td>ASTM D 5664-01</td>
<td>Standard Test Method of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire Treated Lumber</td>
<td>R802.1.3.2.2</td>
</tr>
<tr>
<td>ASTM D 6305-98e1</td>
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<td>R802.1.3.2.1</td>
</tr>
</tbody>
</table>

**Proponent’s Reason:**

2303.2.1 (IRC R802.1.3.1) Reformats the section to better explain the information needed on the product identification mark. The requirements in this section do not require any new information. The elements are already a part of the stamps in the marketplace.

2303.2.2.1 and 2303.2.2.2 (IRC R802.1.3.2.1 and R802.1.3.2.2) The current code section does not specifically identify the testing that needs to be done for material exposed to high temperatures or high humidities or both. This language was introduced into the regional codes around 1988-1989. Since then, ASTM has developed two standards for testing wood treated with Fire-retardant chemicals: ASTM D5516 for wood structural panels and D5664 for lumber.

2302.2.3 (IRC R802.1.3.3) Words “damp or wet locations” were added to alert the code official that there are limitations on where the interior products can be used. Interior FRTW should not be used inside a building where the humidity will be at 92 percent or higher for a sustained period of time nor should it be used in wet interior locations.

2303.2.4 (IRC R802.1.3.4) The term “Type A” is archaic, it is no longer used in the treating industry. The section will also require all interior FRTW to be tested for exposure to high temperature and high humidity. This is a change from the present code provisions. The change recognizes the development of the single code for the entire country. Until then, there were regions of the country where the code did not have uses for FRTW in the roof of a building, therefore, the codes allowed FRTW that did not have the high temperature and high humidity testing. As there is no longer any region where FRTW cannot be used in the roof of a building there is no reason to continue to recognize FRTW that has not been tested for exposure to high temperature and high humidity. This change also recognizes that 99 percent of the FRTW available in the marketplace has been tested. It would be inappropriate for the code to recognize a material that could be improperly used possibly resulting in premature failure of the FRTW.

2303.2.5 (IRC R802.1.3.5) Although Section 2303.2 states that adjustments to the design values must take into consideration the temperature at which the wood is dried after treatment concern has been voiced about the temperature requirements. The added language makes it clear the FRTW in the marketplace cannot be dried at a
temperatures greater than that used in the testing done to establish the design adjustments.

Analysis: Note that proposed new sections, 2303.2.2.1 (IBC) and R802.1.3.2.1 (IRC) are titled wood structural panels, but only address plywood.

A review of ASTM D 6305 indicates compliance with Section 3.6 of the ICC code development process. The proponent must provide test methods ASTM D3043 used to test to ASTM D5516 as well as ASTM D143, D 3500 and D4761 used to test to ASTM D5664.

ITEMS 1 & 3 (IBC)
Committee Action: Approved as Modified

Modify item 1 of proposal as follows:

2303.2 (Supp) Fire-retardant-treated wood. Fire-retardant-treated wood is any wood product which, when impregnated with chemical by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E84, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.

2303.2.1 Labeling. Fire-retardant lumber and wood structural panels shall be labeled. The label shall contain:
1. The identification mark of an approved agency in accordance with Section 1703.5.
2. Identification of the treating manufacturer.
3. The name of the fire-retardant treatment.
4. The species of wood treated.
5. Flame spread and smoke developed rating.
7. Conformance with appropriate standards in accordance with Sections 2303.2.2 through 2303.2.5.
8. For FRTW exposed to weather, damp or wet locations, the words “No increase in the listed classification when subjected to the Standard Rain Test” (ASTM D2898) for FRTW exposed to weather, damp or wet locations.

2303.2.2 Strength adjustments. Design values for untreated lumber and wood structural panels, as specified in Section 2303.1, shall be adjusted for fire-retardant-treated wood. Adjustments to design values shall be based on an approved method of investigation that takes into consideration the effects of the anticipated temperature and humidity to which the fire-retardant-treated wood will be subjected, the type of treatment and redrying procedures.

2303.2.2.1 Wood Structural Panels. The effect of treatment and the method of redrying after treatment, and exposure to high temperatures and high humidities on the allowable design properties of fire-retardant treated lumber shall be determined in accordance with ASTM D 5664. The test data developed by ASTM D 5664 shall be used to develop modification factors for use at or near room temperature and at elevated temperatures and humidity in accordance with an approved method of investigation. Each manufacturer shall publish the modification factors for service at temperatures of not less than 80 F (26.7 C) and for roof framing. The roof framing modification factors shall take into consideration the climatological location.

No modification to remainder of item 1.

Item 3 approved as proposed.

Committee Reason: Agreement with proponent’s published reason. The modification in Section 2303.2.1 makes the application of the provision clearer. The modification in Section 2303.2.2 lowers the service temperature threshold to a level that some manufacturers currently use to evaluate lumber.

Assembly Action: No Motion

ITEMS 2 & 4 (IRC)
Committee Action: Approved as Modified

Modify item 2 of proposal as follows:

R802.1.3.1 (Supp) Labeling. Fire-retardant treated lumber and wood structural panels shall be labeled. The label shall contain:
1. The identification mark of an approved agency in accordance with Section 1703.5 of the International Building Code.
2. Identification of the treating manufacturer.
3. The name of the fire-retardant treatment.
4. The species of wood treated.
5. Flame spread and smoke developed rating.
7. Conformance with appropriate standards in accordance with Sections R802.1.3.2 through R802.1.3.5.
8. For FRTW exposed to weather, damp or wet location, the words “No increase in the listed classification when subjected to the Standard Rain Test” (ASTM D2898) for FRTW exposed to weather, damp or wet condition.

R802.1.3.2.2 Lumber. For each species of wood treated the effect of the treatment and the method of redrying after treatment and exposure to high temperatures and high humidities on the allowable design properties of fire-retardant treated lumber shall be determined in accordance with ASTM D 5664. The test data developed by ASTM D 5664 shall be used to develop modification factors for use at or near room temperature and at elevated temperatures and humidity in accordance with an approved method of investigation. Each manufacturer shall publish the modification factors for service at temperatures of not less than 80 F (26.7 C) and for roof framing. The roof framing modification factors shall take into consideration the climatological location.

R802.1.3.4 Interior applications. Interior fire-retardant treated wood shall have a moisture content of not over 28 percent when tested in accordance with ASTM D 3201 procedures at 92 percent relative humidity. Interior fire-retardant treated wood shall be tested in
accordance with Section R802.1.3.2.1 or R802.1.3.2.2. Interior fire-retardant-treated wood designated as Type A shall be tested in accordance with the provisions of this section.

Item 4 approved as proposed.

Committee Reason: Based on proponent’s published reason. The modification was made to lower the threshold temperature and to retain the Type A designation.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

John F. Hall, American Wood-Preservers’ Association, requests Approved as Modified by this comment.

Modify item 1 of proposal as follows:

2303.2.4 Interior applications. Interior fire-retardant treated wood shall have a moisture content of not over 28 percent when tested in accordance with ASTM D3201 procedures at 92 percent relative humidity. Interior fire-retardant treated wood designated as “Type A” shall be tested in accordance with Section 2303.2.2.1 or 2303.2.2.2.

No changes to remainder of item 1.

Items 2, 3 & 4 as previously approved.

Commenter’s Reason: This proposal has four parts: two were heard by the Structural Committee and two by the Residential Committee. Parts 3 and 4 were approved as submitted. Parts 1 and 2 were modified by each committee. Between the time the Structural Committee heard the code change and modified Part 1 and the time the Residential committee heard the change, industry met and agreed to add additional wording to address expressed concerns about parts 1 and 2. As submitted, parts 1 and 2 were the same. As recommended for approval, there is now a difference. We are recommending that the language accepted by the Residential Committee be incorporated into the language accepted by the Structural Committee. Approval will resolve an inconsistency between the Residential Code and The International Building Code.

Analysis: A review of ASTM D5516, D5664 and D6305 indicates compliance with Section 3.6 of the ICC code development process.

S167-02
2303.7, 2304.3.3

Proposed Change as Submitted:

Proponent: David P. Tyree, P.E., C.B.O., American Forest & Paper Association

Add new text as follows:

1. 2303.7 Shrinkage. Consideration shall be given in design to the possible effect of cross-grain dimensional changes considered vertically which may occur in lumber fabricated in a green condition.

2. 2304.3.3. Shrinkage. Wood walls and bearing partitions shall not support more than two floors and a roof unless an analysis satisfactory to the building official shows that shrinkage of the wood framing will not have adverse effects on the structure or any plumbing, electrical, or mechanical systems, or other equipment installed therein due to excessive shrinkage or differential movements caused by shrinkage. The analysis shall also show that the roof drainage system and the foregoing systems or equipment will not be adversely affected or, as an alternate, such systems shall be designed to accommodate the differential shrinkage or movements.

Proponent’s Reason: In the drafting the 2000 IBC, the provisions concerning the effects of shrinkage on wood members were overlooked and should be included in the General Construction provisions of
Chapter 23. These provisions were originally placed in the UBC to take into account the cumulative effects of shrinkage for horizontal wood frame members (joists and stud wall plates) and its effect on plumbing and mechanical systems. There are reported cases in multistory wood-frame projects where shrinkage was not considered in the building design, and therefore the framing had shrunk, causing plumbing breaks in the stud walls. While some building designers are familiar with multistory wood frame, and the need to do shrinkage analysis, other designers may not be aware of this concern. The popularity of four and five story wood-frame construction is growing and in some areas of the country designers may be less familiar with multistory wood frame. The added text in Section 2304.3.3 will bring the issue of shrinkage to the attention of the designer. The text being proposed in Section 2303.7 applies to areas where green lumber is used in construction and has been in the past considered a west coast issue. The basis of this requirement is green lumber shrinks more than dry lumber, and therefore shrinkage should be addressed in buildings more than two stories in height.

**Analysis:** Is the proposed text specific enough for use by the designer and uniform enforcement by the code officials?

**Committee Action:** Approved as Submitted

**Committee Reason:** Based on proponent’s published reason.

**Assembly Action:** No Motion

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**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Clifford M. Skogstad, City of St. Michael; representing Minnesota Building Officials, requests Disapproved.

**Commenter’s Reason:** It is a regional issue that can be addressed by local amendment. Text not specific enough and uniform enforcement may be jeopardized.

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**S171-02**

**2304.10.5**

**Proposed Change as Submitted:**

**Proponent:** Stephanie J. Young, P.E., National Council of Structural Engineers Association; representing NCSEA Code Advisory Committee - General Engineering Subcommittee

**Revise as follows:**

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**S179-02**

**2306.1**

**Proposed Change as Submitted:**

**Proponent:** David P. Tyree, PE., CBO, American Forrest & Paper Association
Revise as follows:

1. **2306.1 Allowable stress design.** The structural analysis and construction of wood elements in structures using allowable design methods shall be in accordance with the following applicable standards.

   **American Society of Agriculture Engineers.**
   ASAE EP 484.2 Diaphragm Design of Metal-Clad, Post-Frame Rectangular Buildings
   ANSI/ASAE EP486.1 Shallow Post Foundation Design
   ASAE 559 Design Requirement and Bending Properties for Mechanically Laminated Columns

   Other standards unchanged.

2. **Add new referenced standard to Chapter 35 as follows:**

<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Title</th>
<th>Referenced section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI/ASAE EP486.1</td>
<td>Shallow Post Foundation Design</td>
<td>2306.1</td>
</tr>
</tbody>
</table>

   **Proponent’s Reason:** The purpose of this engineering practice is to provide a design procedure for shallow post foundations that resist moments and lateral and vertical forces acting upon them. The design procedure provides the necessary definitions, material requirements, and design equations for post foundations. This proposal is simply adding a reference to an ANSI Standard for Shallow Post and Foundation Design.

   This Standard was developed by the ASAE Post and Pole Foundation Subcommittee; approved by the structures and Environment Division Standards committee; adopted by ASAE in March 1991; revised a number of times from 1992 to 1999; and just recently approved as an American Standard in October 2000. Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer. Consensus is established when, in the judgement of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Consensus requires that all reviews and objections be considered, and that a concerted effort be made toward their resolution.

   **Analysis:** A review of the proposed referenced standard demonstrates compliance with Section 3.6 of the ICC code development process.

   **Committee Action:** Disapproved

   **Committee Reason:** There are no criteria for seismic design for the proposed system.

   **Assembly Action:** No Motion

   **Individual Consideration Agenda**

   This item is on the agenda for individual consideration because a public comment was submitted.

   **Public Comment:**

   David P. Tyree, P.E., C.B.O., American Forest and Paper Association, requests Approved As Submitted.

   **Commenter’s Reason:** The purpose of this engineering practice is to provide a design procedure for shallow post foundations that resist moments and lateral and vertical forces acting upon them. The design procedure provides the necessary definitions, material requirements, and design equations for post foundations. This proposal is simply adding a reference to an ANSI Standard for Shallow Post and Foundation Design. This Standard was developed by the ASAE Post and Pole Foundation Subcommittee; approved by the Structures and Environment Division Standards Committee; adopted by ASAE in March 1991; revised a number of times from 1992 to 1999; and just recently approved as an American Standard in October 2000. Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer. The committee’s
action was not consistent in that they approved other ANSI Standards
during the hearings but not this one based on testimony that was
irrelevant to this Standard. The committee was concerned that the
document did not address seismic issues. As in any Standard of this
sort, it specifies the “resistance” values for any design. The loading
side of the equation, which takes into account wind and seismic, is
addressed in Chapter 16 of the IBC. This ANSI Standard will assist the
designer in his design to resist seismic loads, without it, the designer
will lose a valuable reference. To be consistent with other actions taken
by the Committee, this item should be reconsidered and Approved As
Submitted.

S183-02
T2308.9.3(1)

Proposed Change as Submitted

Proponent: Fulton Desler, APA - The Engineered Wood
Association

Revise as follows:

<table>
<thead>
<tr>
<th>SEISMIC DESIGN CATEGORY</th>
<th>CONDITION</th>
<th>CONSTRUCTION METHODS(^{a, c})</th>
<th>BRACED PANEL LOCATION AND LENGTH(^{a})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>A and B</td>
<td>One story, top of two or three story</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>First story of two story or second story of three story</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>First story of three story</td>
<td>–</td>
<td>X</td>
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<td></td>
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</tr>
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<td></td>
<td>First story of two story or second of three story</td>
<td>–</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>First story of three story</td>
<td>–</td>
<td>X</td>
</tr>
</tbody>
</table>

footnotes a. through g. No change.
h. Horizontal joints of wood structural panel braced wall panels, as provided for in Section 2308.9.3, shall be permitted to be unblocked.

**Proponent’s Reason:** The current Uniform Building Code and Standard Building Code require no blocking at horizontal wood structural panel joints when used as braced wall panels on the basis of equivalent performance with other permitted materials. This proposed code change would require blocked wood structural panel sheathing to be used only in those applications where additional racking resistance is structurally necessary.

In addition, the UBC Section 2320.11.3 Method 3, referencing Table 23-IV-D-a, and the 1999 Standard Building Code, Section 2308.2 referencing Table 2308-1B, both contain footnotes which exempt wood structural panels from the general requirement for blocking of horizontal joints.

**Cost Impact:** This change should result in a decreased cost of construction as it eliminates the requirement for blocking in those areas where blocking is not required.

**Committee Action:** Disapproved

**Committee Reason:** Committee is of the opinion that when Table 2308.9.3(1) was originally drafted, blocking was necessary.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because public comments were submitted.

**Public Comment 1:**

Carl Eriksson, Park City, Utah; representing Utah Chapter ICC, requests Approved As Submitted.

**Commenter’s Reason:** The only reason given in Pittsburgh for disapproving the change was that the original drafting committee thought blocking was necessary. None of the reasons the original drafting committee considered was presented. None of the information supporting the change was discussed by the committee. This change should therefore be reconsidered by evaluating the following information:

The current Uniform Building Code as well as the International Residential Code requires no blocking at horizontal wood structural panel joints when used as braced wall panels. This proposed code change would permit unblocked wood structural panel sheathing as bracing only in those applications where the additional racking resistance facilitated by the blocking at horizontal edges is not structurally required. This determination is based on a comparison with other accepted bracing materials in IBC Table 2308.9.3(1), and their corresponding design values.

The justification for the proposed change is as follows:

ASTM E72 shear wall tests conducted by APA and outlined in APA Research Report 154 – Wood Structural Panel Shear Walls – showed that an unblocked wood structural panel braced wall panel has a minimum ultimate load of 550 plf. This load is based upon a maximum deflection of 0.20 inch at design load. (The data supporting this statement is available in APA Research Report 154 – Wood Structural Panel Shear Walls. Copies were provided for the committee’s use with the original submission.) From the ultimate load value, a design load of 196 plf can be derived (550 plf / 2.8 = 196 plf). The deflection criterion 0.20 inch is based on Federal Housing Administration Tech. Circular No. 12 – A Standard for Testing Sheathing Materials for Resistance to Racking – published in 1949. (This document is the basis for the deflection criteria used in current shear wall testing and the early bracing requirements.) This equates to a total capacity for the unblocked wood structural panel-bracing panel of (196 plf x 4) 784 pounds per 4-foot section. This compares favorably with the design loads, obtainable from the tables in the IBC, for 1/2” structural fiberboard (500 lb), 1/2” gypsum board (480 lb) and 3/8” particleboard (480 lb).

**Public Comment 2:**

Fulton Desler, APA-The Engineered Wood Association, requests Approved As Submitted.

**S186-02**

2404.2, 2405.4, 2405.5, 2610.1 (IRC R308.6.9)

**Proposed Change as Submitted:**

**Proponent:** Julie Ruth, JRuth Code consulting; representing American Architectural Manufacturers Association (AAMA)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.
Revise as follows:

1. **IBC 2404.2 Sloped glass.** Glass sloped more than 15 degrees (0.26 rad) from vertical in skylights, sunroom spaces, sloped roofs and other exterior applications shall be designed to resist the most critical of the following combinations of loads.

   1. \( F_g = W_o - D \) \hspace{1cm} (Equation 24-3)
   2. \( F_g = W_i + D + 0.5 \ S \) \hspace{1cm} (Equation 24-4)
   3. \( F_g = 0.5 \ W_i + D + S \) \hspace{1cm} (Equation 24-5)

   where

   \( D \) = Glass dead load (Psf)

   For glass sloped 30 degrees (0.52 rad) or less from horizontal,

   \( D = 13 \ t_g \cos \) (For SI: 0.0245 \( t_g \))

   \( F_g \) = Total load, psf (kN/m\(^2\)) on glass.

   \( S \) = Snow load, psf (kN/m\(^2\)) as determined in Section 1608.

   \( t_g \) = Total glass thickness, inches (mm) of glass panes and plies.

   \( W_i \) = Inward wind force, psf (kN/m\(^2\)) as calculated in Section 1609.

   \( W_o \) = Outward wind force, psf (kN/m\(^2\)) as calculated in Section 1609.

   \( \gamma \) = Angle of slope from horizontal.

   **Exception:** Installation of a skylight without a curb shall be permitted on roofs with a minimum slope of 14 degrees (3 units vertical in 12 units horizontal) in Group R-3 occupancies as applicable in Section 101.2. All unit skylights installed in a roof with a pitch flatter than 14 degrees (0.25 rad) shall be mounted at least 4 inches (102 mm) above the plane of the roof on a curb construction as required for the frame unless otherwise specified in the manufacturer’s installation instructions.

3. **IBC 2405.5 Unit Skylights.** Unit skylights shall be tested and labeled as complying with NAFS-1. The label shall state the name of the manufacturer, the approved labeling agency, the product designation and the performance grade rating as specified in NAFS-1. If the product manufacturer has chosen to have the performance grade of the skylight rated separately for positive and negative design pressure, then the label shall state both performance grade ratings as specified in NAFS-1 and the skylight shall comply with Section 2405.5.2. If the skylight is not rated separately for positive and negative pressure, then the performance grade rating shown on the label shall be the performance grade rating determined in accordance with NAFS-1 for both positive and negative design pressure, and the skylight shall conform to Section 2405.5.1.

   **2405.5.1 Unit Skylights rated for the same performance grade for both positive and negative design pressure.** The design of unit skylights shall be based on the following equation:

   \( F_g \frac{PG}{PG} \) \hspace{1cm} (Equation 24-8)

   where:

   \( F_g \) is the maximum load on the skylight determined from load combinations 1, 2 and 3 in Section 2404.2.

   \( PG \) is the performance grade rating of the skylight.

   **2405.5.2 Unit Skylights rated for separate performance grades for positive and negative design pressure.** The design of unit skylights rated for performance grade for both positive and negative design pressures shall be based on the following equations:

   \( F_g \frac{PG_{Pos}}{PG_{Neg}} \) \hspace{1cm} (Equation 24-9)

   \( F_g \frac{PG_{Neg}}{PG_{Pos}} \) \hspace{1cm} (Equation 24-10)

   Where:

   **2. IBC 2404.4 (Supp) Framing.** In Types 1 and 2 construction, sloped glazing and skylight frames shall be constructed of noncombustible materials. In structures where acid fumes, deleterious to metal are incidental to the use of the buildings, approved pressure-treated wood or other approved noncorrosive materials are permitted to be used for sash and frames. Framing supporting sloped glazing and skylights shall be designed to resist the tributary roof loads in Chapter 16. Skylights set at an angle of less than 45 degrees (0.79 rad) from the horizontal plane shall be mounted at least 4 inches (102 mm) above the plane of the roof on a curb construction as required for the frame. Skylights shall not be installed in the plane of the roof where the roof pitch is less than 45 degrees (0.79 rad) from the horizontal.

   **Remainder of section unchanged.**
PG_{pos} is the performance grade rating of the skylight under positive design pressure.

PG_{neg} is the performance grade rating of the skylight under negative design pressure, and

F_{gi} and F_{go} are determined in accordance with the following:

If W_o > D, where W_o is the outward wind force, psf (kN/m^2) as calculated in Section 1609 and D is the dead weight of the glazing, psf (kN/m^2) as determined in Section 2404.2 for glass, or by the weight of the plastic, psf (kN/m^2) for plastic glazing.

\[ F_{gi} \] is the maximum load on the skylight determined from load combinations 2 and 3 in Section 2404.2.

\[ F_{go} \] is the maximum load on the skylight determined from load combination 1.

If W_o < D, where W_o is the outward wind force, psf (kN/m^2) as calculated in Section 1609 and D is the dead weight of the glazing, as determined in Section 2404.2 for glass, or by the weight of the plastic for plastic glazing.

\[ F_{gi} \] is the maximum load on the skylight determined from load combinations 1, 2 and 3 in Section 2404.2.

\[ F_{go} = 0 \]

Renumber equations in 24-8 through 24-12.

4. IRC R308.6.9 Testing and labeling. Unit skylights shall be tested by an approved independent laboratory, and bear a label identifying manufacturer, performance grade rating, and approved inspection agency to indicate compliance with the requirements of the following specification:

NAFS-1

5. IBC Add new referenced standard to Chapter 35 as follows:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAMA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NAFS-1.00 Voluntary Performance Specification for Window, Skylights and Glass

| Doors | 2405.5 |

128 2002 ICC FINAL ACTION AGENDA
6. IRC Add new referenced standard to Chapter 43 as follows:

<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Title</th>
<th>Referenced in code section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAFS-1</td>
<td>Voluntary Performance Specification for Window, Skylights and Glass Doors</td>
<td>R308.6.9</td>
</tr>
</tbody>
</table>

7. IBC 2610.1 Light-transmitting plastic glazing of skylight assemblies. Skylight assemblies glazed with light-transmitting plastic shall conform to the provisions of this section and Section 2606. Unit skylights glazed with light-transmitting plastic shall also comply with Section 2405.5.

Proponent's Reason: This code change establishes separate design provisions in the IBC for unit skylights that are consistent with those provided for sloped glazing in Section 2402, but which permit the unit skylights to be designed separately for maximum positive and negative pressure. This method of rating skylights is addressed in the North American Fenestration Standard - NAFS 1-00 Voluntary Performance Specification for Windows, Skylights and Glass Doors, which is referenced in the proposed revisions. A separate code change proposal adds a definition for unit skylights to both the International Building Code and the International Residential Code to distinguish these single panel, factory assembled units from other types of skylights and sloped glazing installations.

Unlike windows, the most critical uniform load on a skylight (positive or negative) will depend on the climate into which it is installed. In northern areas where heavy snow loads are common, and design wind speeds are moderate, the positive load on the skylight form the combined snow and dead load is more critical than the negative load from wind uplift. The opposite is true in warm, coastal climates with high design wind speeds, and little or no snow load.

This fact was recognized by the harmonization task group that developed the NAFS-1. The resulting separate rating system for positive and negative pressure on skylights allows the manufacturer to design and fabricate products that are best suited for the climate in which they will be used.

NAFS-1 establishes the performance requirements for skylights based on the desired performance grade rating. The minimum performance requirements include resistance to air leakage, water infiltration, and the design load pressures of the International Codes, as well as operator specific requirements for hardware and framing. The resulting performance grade rating states the design load pressure used to rate the product, but the phrase performance grade rating is used to emphasize that the performance grade rating includes consideration of these additional performance characteristics.

If a model of skylight is only certified for one performance grade, the rating is based on the minimum requirements met for both positive and negative design pressure. Skylights certified for two performance grades are rated separately for resistance to positive design pressure, and for resistance to negative design pressure.

NAFS-1 is intended as a replacement to AAMA/NWWDA 101/I.S.2, which is already referenced in Section 1714.5 of the IBC and in Section R613.3 of the IRC for windows and glass doors. One of the improvements made to the provisions of AAMA/NWWDA 101/I.S.2 in the development of NAFS 1 is the expansion of the scope of the document to include skylights. Now the minimum performance requirements of AAMA/NWWDA 101/I.S.2 that are already established for windows and glass doors can also be provided for skylights in the International Codes.

The proposed revision to Section 2404.2 directs the user to the design provisions of Section 2404.5, while maintaining the current intent that unit skylights, as a type of sloped glazing, are subject to the other requirements of the code for sloped glazing.

Section 2405.4 is revised to be consistent with its scope, which is framing. The loading provisions of the glazing are covered in Section 2404.2 and 2405.5.

Proposed Section 2405.5.1 establishes the requirement that the minimum performance grade rating of the skylight must not be exceeded by any of the load combinations given in Section 2404.2, when the skylight has not been rated for positive and negative design pressure separately. Proposed Section 2405.5.2 establishes the two sets of requirements for skylights that are rated separately for positive and negative design pressure, such that the performance grade rating for positive design pressure is not exceeded by the load combinations that include dead load, snow and wind acting towards the face of the skylight, and the performance grade rating for negative design pressure is not exceeded by the load combination that considers wind acting away from the face of the skylight.

NAFS-1 was developed as a harmonized standard between Canada and the United States for windows, skylights and glass doors. Participants in the development of this specification included representatives of American Architectural Manufacturers Association (AAMA), Canadian Standards Association (CSA), Canadian Window and Door Manufacturers Association (CWDMA), National Fenestration Rating Council (NFRC), National Research Council of Canada (NRC/IRC), and Window and Door Manufacturers Association (WDMA).

NAFS-1 is currently undergoing canvas balloting through the ANSI process. It is hoped that this process will be completed before the ICC Spring Hearings in April 2002.

Analysis: The proponent should submit copies of the proposed referenced standard for review for conformance to Section 3.6 of the ICC code development process.

ITEMS 1, 2, 3, 5 & 7 (IBC)
Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

ITEMS 4 & 6 (IRC)
Committee Action: Approved as Submitted
Committee Reason: Based on the proponent’s published reason.

Staff Note: If the final version of the standard (NASF-1) is not readily available and received for staff review by the deadline for receiving public comments, S186-02 will be placed on the Final Action Individual Consideration Agenda.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration due to the status of the referenced standard. See the analysis statement.

Analysis: The NAFS-1-02 standard was submitted for staff review during the Public Comment phase. Staff review demonstrated compliance with Section 3.6 of the ICC code development process with the following exception: the standard was developed under a consensus process but final approval by ANSI has not been received. Also see S95-02 & EC18-02.

S188-02
2406.1 (IRC R308.3)

Proposed Change as Submitted:

Proponent: Kate Steel, O’Keeffe’s, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

Revise as follows:

1. IBC 2406 SAFETY GLAZING

2406.1 Human impact loads. Individual glazed areas, including glass mirrors, in hazardous locations as defined in Section 2406.2 shall pass the test requirements of CPSC 16 CFR 1201, listed in Chapter 35. Glazing shall comply with the CPSC 16 CFR, Part 1201 criteria for Category I or Category II as indicated in Table 2406.1

Exceptions:
1. Polished wire glass installed in fire doors, fire windows and view panels in fire resistant walls shall comply with ANSI Z97.1 listed in Chapter 35.
2-1. Plastic glazing shall meet the weathering requirements of ANSI Z97.1 listed in Chapter 35.
3-2. Glass-block walls shall comply with Section 2101.2.4.
4-3. Louvered windows and jalousies shall comply with Section 2403.5.

2. IRC R308.3 Human impact loads. Individual glazed areas including glass mirrors in hazardous locations such as those indicated as defined in Section R308.4 shall pass the test requirements of CPSC16CFR, Part 1201. Glazing shall comply with the CPSC 16 CFR, Part 1201 criteria for Category I or Category II as indicated in Table R308.3.

Exceptions:

9. Polished wire glass installed in fire doors and other fire resistant locations comply with ANSI Z97.1.
2-1. Louvered windows and jalousies shall comply with Section R308.2.
3-2. Glass unit masonry.

Proponent’s Reason: Fire-rated wired glass is used in fire doors and other assemblies in human impact areas where it has been accidentally impacted by children and young adults who’ve suffered severe and life-threatening injuries resulting in amputations, paralysis, and impaired mobility due to permanent nerve damage. Building code changes are needed to protect the public from the unsafe use of wired glass, and the proposed revision to IBC Section 2406.1 meets that objective.

Despite successive recommendations by two ICC code committees the last two years for approval of the proposal to eliminate the lower test standard applied to wired glass and require compliance with the CPSC safety glazing standard, the four foreign manufacturers of wired glass and their U.S. distributors and business affiliates have successfully blocked these changes from going through the building code development process by appealing procedural technicalities. Meanwhile, injuries continue to occur in schools, college dormitories, athletic facilities, and anywhere else wired glass is used for fire protection in areas subject to accidental impact.

Wired glass interests return this year to try out a new spin on an old argument they lost last year, and the year before, when the Structural Committee said wired glass has to meet the same safety standard as other glazing materials, and found wired glass manufacturers hadn’t stated any credible reason why they couldn’t, after a 25-year grace period, make a complying wired glass product, when it was evident that the rest of the industry had developed technology.
Wired glass is not safety glazing. The wires give the illusion of safety, but in fact they weaken the glass, and wired glass is only half as strong as regular glass. Wired glass breaks easily, and exposes razor sharp wires, which trap the victim's body in the opening and slice him as he tries to withdraw.

Wired glass is exempt from Federal Safety Glazing Regulations. Wired glass does not meet the CPSC federal safety glazing standard enacted in 1977 that applies to glazing used in doors and other areas subject to human impact. The CPSC found wired glass was dangerous, but exempted wired glass in fire assemblies from federal regulation at that time because it was the only fire-protection glazing available that met building code requirements for use as vision panels in fire doors and windows. The exemption was supposed to last 2-1/2 years, to give industry time to develop technology to make a fire glazing that was also impact safe, but the foreign wired glass manufacturers challenged the exemption termination date as arbitrary. The federal court returned the matter to the CPSC to develop supplemental facts, but the CPSC instead issued an amendment to remove the termination date without further hearing.

As a result, wired glass in fire assemblies has been exempt from the CPSC impact test requirements, and subject to the lower ANSI Z97.1 test standard applied by the building codes, even though CPSC rejected ANSI Z97.1 as an inadequate safety standard because it only protects children under five. All other glazing materials, including non-wired fire glazing materials, are subject to the higher CPSC impact safety glazing standard.

Wired glass does not meet the lower ANSI Z97.1 standard applied by building codes. There is solid test data that wired glass does not even meet the lower ANSI Z97.1 impact test. Because wired glass is not required to be certified by a third-party test agency to meet ANSI Z97.1, wired glass manufacturers can “self-certify” compliance. Impact tests done on wired glass purchased on the open market show none of the four wired glass products imported into the US meet ANSI Z97.1. The British manufacturer makes a second “safety” wired glass product for the British market that has to be certified by an approved test agency to meet the UK safety standard (which is the same as ANSI Z97.1), and admits its regular wired glass product doesn’t meet the UK standard. Wired glass manufacturers’ representatives have testified at code hearings that wired glass meets the ANSI Z97.1 standard, but have never produced any test reports to substantiate compliance.

Several fire glazing alternatives meet CPSC impact standards. There are now several non-wired fire glazing alternatives to wired glass that meet the CPSC safety glazing standard, so there is no longer a need for the wired glass exemption. Some alternatives are comparable in price to wired glass, other are more expensive, but also provide superior fire-protection.

Wired glass manufacturers can make a wired glass product that meets CPSC standards. Special safety film products have been developed that can be applied to wired glass to make it impact-safe without affecting its fire-protection performance, at an increased cost of only $1- $3/sq. ft. Wired glass manufacturers told the ANSI Z97.1 Committee that they do not want to make a laminated wired glass product, and they'd pull out of the US market if they had to meet the CPSC standard. Based on information known within the industry, however, there is every indication that wired glass manufacturers have already tested a wired glass product with safety film to meet US fire and CPSC impact test standards and are in a position to market that product as soon as the codes require compliance with the CPSC standard.

It’s time for that to happen, and see that the action taken by the ICC code committees last year is reaffirmed at this year’s code hearings, and final action is taken by the membership to accept this code change and conclude the code process.

BIBLIOGRAPHY

1. Memorandum dated September 11, 2001, from Kate Steel to ICC Ad Hoc Committee on Installation of Safety Glass in Hazardous Locations.


14. Wired Glass Injury Chart


17. Videotape: Chicago Channel 7 News Target, “Wired Glass”


20. WH/ITS 45-minute Fire Endurance Test in accordance with fire tests standards and the CPSC safety glazing standard of O’Keefe laminated-type wired glass product using one of the new fire-resistant safety films.


22. University of Oregon fax to Greg Abel, regarding costs to laminate gym door windows, February 19, 2001 and February 15, 2001 fax from supplier of safety film product regarding UL 94 Flame Class rating and impact test reports classifying 4 mm film tests to Category 1, and the 7 mm film tests to Category II.


to substitute "tempered glass in place of wire glass and in high impact area.


27. Transcript of March 26, 2001 Public Hearing on S80-01 and S80a-01 and Open Forum.

28. October 18, 2001 letter from S. Hojnowski and Test Reports on impact tests conducted by Architectural Testing on 9/24/01 of wired glass and wired glass with applied safety film.

29. Memorandum to Structural Committee and Residential Building and Energy Committee from Kate Steel on behalf of O’Keefe’s, Inc. re summary of evidence and reasons in support of proposed change to IBC Section 2406.1 (formerly S91-00 and S80a-01)

ITEM 1 (IBC)
Committee Action: Disapproved
Committee Reason: Based on action taken on S187-02.
Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved
Committee Reason: To be consistent with the action taken, on Item 1, by the IBC Structural Committee.
Assembly Action: No Motion

Individual Consideration Agenda
This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:
Greg Abel, Advocates for Safe Glass, requests Approved As Submitted for items 1 and 2.

Commenter’s Reason: On behalf of Advocates for Safe Glass, Inc. (“AFSGI”), I respectfully request that you approve S188-02 as submitted.

I am Chair of Advocates for Safe Glass, Inc. (“AFSGI”), a non-profit corporation recently formed by parents of victims injured by wired glass, whose mission is to advocate the safe use of glazing materials in buildings and effective regulation of safety glazing by code administrators and enforcement officials. Because our children were injured as a result of accidental impact with wired glass in doors and windows, we became interested in code requirements for the use of safety glazing materials in buildings, and the testing and certification of safety glazing products to the federal CPSC safety glazing standard, CPSE 16 CFR 1201.

I first became involved in the wired glass safety issue after my son, Jarred, was severely injured in January 2001 when he accidentally impacted a wired glass vision panel in a fire door installed in a gymnasium at the University of Oregon in Eugene. Those of you at last year’s Structural Committee code hearings may remember Jarred and I spoke in support of S80a-01, as did a young high school boy from Utah, Brett Turman, and his father, Greg Turman. We left the hearing at the end of the day with a great deal of respect for the Integrity and clear thinking of the Structural Committee’s members, and the leadership of its Chairman in ensuring their only agenda was to recommend actions to safeguard public welfare. The Structural Committee upheld our interests—the public’s interests—and made it clear to wired glass representatives that the code process is not a bargaining table where they can negotiate public safety.

While we appreciate the ICC Ad Hoc Committee’s subsequent recognition of the dangers of wired glass in schools and gymnasiums, we strongly believe there is no reason for any child or adult in any building to be at risk of serious injury by continued acceptance of wired glass under a lower impact test standard. AFSG has collected a lot of injury evidence showing that the dangers of wired glass are not limited to schools K-12. I’ve personally confirmed injuries in apartment buildings, fraternity residences, hospitals with psychiatric units, convalescent homes, university buildings and college dorms, and I’ve had reports of injuries in other building uses that I’ve not personally verified, but come from credible sources.

In our pursuit of code changes and drive to educate the public about wired glass hazards, we have spoken to people all over the country. I’ve met with and obtained the proactive support of national public safety and consumer interest organizations based in Washington D.C.; National Safe Kids Campaign (headed by former U.S. Surgeon General Koop), Children’s Safety Network, and Consumers Union. These organizations recognize the unacceptable public safety threat and have issued advisory notices and taken other proactive measures to warn of the hazards of wired glass. Consumers Union is in the process of conducting its own investigation and preparing an in-depth consumer report for national publication.

When alternative fire-rated products meeting CPSC impact requirements are available and wired glass manufacturers have the technology to make fire-rated wired glass products that comply, there is no conscionable reason for putting a single child or adult at risk of suffering the kind of injury we’ve shown occurs over and over as a result of impact with wired glass. You have a substantial record of supporting evidence to justify that action by way of Impact test reports, injury documentation, advisory notices, etc., whereas wired glass have submitted no evidence to support a compromise action. You don’t need any more injury evidence to justify eliminating the wired glass exception for all building uses. All we are asking is that you approve a code change that holds wired glass to the same impact performance standards you apply to every other glazing product.

Alternative Fire-rated Safety Glazing and Laminated Wired Glass

ASFG has found building officials don’t have to accept wired glass products that endanger our children’s impact safety to protect them against fire hazards. We investigated alternative fire-protection glazing products sold in the U.S., and found several products meet both fire
code and CPSC impact safety standards, and some products are made right here in the U.S. We also found an organic safety film product can be applied to wired glass to meet CPSC Cat I and II, without diminishing the glazing rating, and wired glass specimens with special impact film have been fire tested successfully for a 45 minute fire endurance period.

You may hear wired glass representative suggest they have test data to show wired glass with safety film doesn’t meet the fire test standards. I don’t believe their claim for several reasons. I’ve asked repeatedly for those test reports, as have a lot of other people, but they’ve never provided them. I also remember they testified last March to the Structural Committee that wired glass with safety film couldn’t pass CPSC impact criteria, but six months later they admitted to the ICC Ad Hoc Committee they had test results showing it does comply with CPSC standards after all, but failed fire tests they conducted. The proponent of this code change on the other hand, submitted fire test data showing 45-minute fire protection, and the film manufacturer provided additional supporting data. I also confirmed the successful performance of a similar safety film product used to make a laminated fire-rated ceramic glazing product that’s been listed by UL for several years.

It’s pretty obvious wired glass manufacturers have run out of technology-based excuses for continuing the exception—all after, they’ve had 25 years to come up with improvements, and look at the advances in other fire-rated products. They’ve got the technology to make a complying product, and we urge you to eliminate the exception and force them to use it.

**Fire-rated alternatives to wired glass**

There are many alternative fire-rated glazing products on the market today, which range in fire protection from 20-minutes to three hours. The non-wired replacement alternatives start at $10-$25 for a 20-minute rated tempered glazing products, and the cost difference is a reasonable price for impact safety. Although wired glass manufacturers always argue the higher cost of alternatives is a reason to extend the exception, that’s really an issue for users to discuss in context of other factors. Based on AFSGI’s investigation, cost is a lot less of a concern for the market than wired glass manufacturers claim it is, especially when users know the true facts about wired glass impact performance and injury reports. For example, AFSGI confirmed school districts in some localities have eliminated the replacement use of wired glass in impact locations as a matter of choice because of their own injury experience and replacement costs. Some issued district-wide policies to exclude wired glass replacements years ago when new fire-rated safety alternatives first came on the U.S. market, and directed use of labeled safety alternatives to replace broken panels in fire doors and windows.

We have found user cost concerns are partly based on the misperception that wired glass has comparable impact strength to safety glazing products and a good field-safety record, and the higher price is mistaken as the aesthetic cost for glass without wires. Once the facts are explained—that wired glass has 1/10th the impact strength of tempered safety glazing, and has caused significant injuries—school boards, university facilities, managers, hospital in-house building design and construction specialists, state risk managers, general architects, other users realize the added value of safety benefits all user classes, and not just schools and gymnasiums. User interests don’t need any more injury data than what was submitted to the ICC Ad Hoc Committee to convince them that wired glass shouldn’t be used in impact locations in any kind of building.

*Injury Evidence Proves Wired Glass is Dangerous in Impact Locations*

We learned very early on in our investigation of wired glass injuries that the CPSC’s glazing injury data is not product-specific. Because the CPSC does not require it’s injury reporting source, NEISS, to track annual glazing injuries by specific products, it can’t be determined what percentage of all glazing injuries reported to NEISS is related to wired glass, plate glass, laminated glass, or any other category of glazing material. With other fire-rated options available that offer impact safety, and safety film for 45-minute wired glass that meets Category VII ft., the ICC can’t justify allowing wired glass that’s half as strong as plain glass with razor sharp wires in impact areas of any building use under a lower standard that doesn’t even protect a five-year old child from injury. We don’t need specific injury reports for hotels to justify protecting kids playing in a hotel lobby or outside the exercise room where wired glass view panels are installed, or for factory buildings to protect a worker who’s following co-workers out the door at lunchtime and puts his hand up to stop it from closing, and contacts the wired glass panel.

We urge you to approve S188-02 as submitted.

**Public Comment 2:**

Kate Steel, representing O’KEEFFE’S INC., requests Approved As Submitted for items 1 and 2.

**Commenter’s Reason:** Wired glass isn’t safety glazing. No one disputes that fact, not even wired glass manufacturers. Only half as strong as regular annealed glass, wired glass breaks easily on impact and is more dangerous when broken. The exposed wires are razor-sharp, and act like a spider web to trap a victim’s body part in the opening, severing arteries, nerves and tendons resulting in permanent, severe injury including paralysis, reduced mobility, disfigurement, even amputation. As an insurer for 91 school districts warned users in an advisory bulletin posted on its website, “wired glass causes horrible injuries” and shouldn’t be used in hazardous locations. www.osbie.org. Proponents of code changes to require wired glass in fire assemblies to comply with the CPSC safety glazing standard, 16 CFR 1201, have compiled substantial evidence of serious injuries involving wired glass in different building uses across the country. A non-profit public safety organization founded by parents of wired glass victims have investigated and confirmed injuries in schools, gymnasiums, university facilities, college dormitories, off-campus fraternity residences, convalescent homes, apartment buildings, hospitals with psychiatric treatment units, and correctional facilities, and their injury information is available on their website at www.safeglass.org.

Two years ago, the four wired glass manufacturers that make the world supply of wired glass adamantly opposed any limitations on the acceptance of wired glass in fire assemblies under the exception, denying there were any more than a handful of wired glass injuries worldwide. Today, they have finally conceded in the face of growing injury data that wired glass is dangerous in impact areas of schools, and they agree the exception allowing its use under a lower ANSI Z97.1 impact standard should be eliminated for E occupancies, i.e, schools K-12. They also agree it shouldn’t be used in athletic facilities including basketball gymnasiums. This is the compromise position they came up with this year and submitted as S187-02, after the Structural Committee recommended approval of O’Keeffe’s proposal to eliminate the exception altogether for the past two years at the code hearings in 2000 (S91-00) and 2001 (S80a-01). The wired glass industry prevented the ICC membership from voting on the Structural Committee’s recommended actions on the proposal both years by appealing procedural technicalities that had nothing to do with the merits.

This code proposal is finally before the membership for final action as S188-02, and proponent urges your approval as submitted. The
compromise proposal backed by wired glass interests is based on their analysis of injury reports they were given two years ago. While their proposal might have been a reasonable start to protecting the public from the dangerous use of wired glass had they proposed it in 2000, today, it’s too little too late. Not only is there substantially more injury data available to support removal of the exception in all occupancies, there is also test data to show that wired glass manufacturers have the technology to make a laminated type of wired glass product that meets both CPSC impact tests and fire protection requirements. There is simply no justification for putting the public at risk of injury by accepting wired glass in any building use under the exception, when wired glass can be made to comply with CPSC requirements by using a safety film product that costs less than $1/sq.ft.

Proponent expects wired glass representatives to come to the final action hearing to oppose this proposal, where they will tell you that the ICC Ad Hoc Committee met for a day and a half, and considered all of the evidence submitted by proponent and voted unanimously to support GICC’s proposal to eliminate the exception in E occupancies only. They will tell you to rely on the Ad Hoc Committee decision, and not on your own judgment, because they spent hours on the issue, and you only have minutes. Proponent submits it only takes a short time to consider simple issues and undisputed facts, and reach a reasonable conclusion using common sense.

Keep in mind that wired glass interests demanded an ad hoc committee to “study” the issue, not this proponent or public safety advocates. Wired glass members needed a lot more time to lay out a narrow proposal and pull together selective injury reports to fit a premise that falls apart as soon as all the facts are considered. It doesn’t follow that wired glass is dangerous in schools but not universities, hotels, apartment buildings and other buildings in areas where impact is likely. The issue’s much simpler. Is there any justification for excusing wired glass from CPSC safety glazing standards in fire assemblies in impact areas where alternative products are available and safety film technology offers solutions for wired glass impact safety at a cost of less than $1/sq.ft. The answer is equally simple: No.

We request your vote for approval of S188-02 as submitted.

S189-02
2406.1.1

Proposed Change as Submitted:

Proponent: Kate Steel, O’Keefe’s, Inc.

Revise as follows:

2406.1.1 Identification of safety glazing. Except as indicated in Section 2406.1.2, each pane of safety glazing installed in hazardous locations shall be identified by a label specifying the labeler, whether the manufacturer or installer bear a label issued by an approved agency, showing the name of the manufacturer, and the safety glazing standard with which it complies, as well as the information specified in Section 2403.1. The label shall be acid etched, sand blasted, ceramic fired, or an embossed mark, or shall be of a type that once applied cannot be removed without being destroyed.

Exceptions:

1. For other than tempered glass, labels are not required, provided the building official is provided with and approves the use of, a certificate or affidavit or other evidence issued by an approved agency confirming compliance with the safety glazing standard specified by this code.

2. Tempered spandrel glass is permitted to be identified by the manufacturer with a removable paper label.

Proponent’s Reason: This code change is consistent with the labeling requirements in the BOCA National Building Code (1996), Section 2405.1.1, and UBC Chapter 24 certification requirements.

Permanent labeling of safety glazing materials provides a visible, permanent means of verification that the glazing material is manufactured, tested and installed in accordance with the requirements of this chapter. The marking must be issued by an approved third-party test agency. It is required to contain the applicable test standard to which the glazing has been tested for compliance, as well as the name of the manufacturer.

This change allows the label to be omitted, provided a certificate of compliance issued by an approved test agency is supplied to and approved by the building official. This allows a local glazing contractor who buys stock sheets of safety glazing materials labeled by the manufacturer (e.g., laminated or applied organic safety film glazing), but isn’t approved by the certification agency to apply approved labels, to cut pieces to size and sell the cut panels as safety glazing products without a label. It also provides the building official assurance that the product is certified by an approved agency.

The need for independent safety glazing certification and labeling is well-established in the glazing industry. As noted in the BOCA Commentary, Volume 2, p24-8, “Many manufacturers of safety glazing materials have their materials certified by the Safety Glazing Certification Council (SGCC) to meet with ANSI Z97.1 or CPSC 16 CFR 1201.” The SGCC statement of concept and procedures confirms the support of the glazing industry for the proper certification of safety glazing materials: “The acceptance of a certified safety glazing material comes form the conviction such certification assures a high level of safety and quality, and that the integrity of the identifying mark or certification label is reliably maintained by a competent certification agency.” The requirement for third-party certification label is reliably maintained by a competent certification agency. The requirement for third-party certification is “based on the conviction that no standard of safety or quality is good without the continuous adherence of the licensees’ certified products to that standard.” (SGCC Certified Products Directory, Procedural Guide.)

Committee Action: Disapproved

Committee Reason: Current requirement for identification of safety glazing is preferred.

Assembly Action: No Motion
Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Greg Abel, Advocates for Safe Glass, requests Approved As Submitted.

Commenter’s Reason: Advocates for Safe Glass, Inc. (“ASGI”) is a non-profit corporation recently formed by parents of victims injured by wired glass, for the purpose of advocating the safe use of glazing materials in buildings and effective regulation of safety glazing by code regulators and enforcement officials. Because our children were injured as a result of accidental impact with wired glass in doors and windows, we became interested in code requirements for the use of safety glazing materials in buildings, and the testing and certification of safety glazing products to the federal CPSC safety glazing standards, CPSC 16 CFR 1201.

We found that most safety glazing materials are certified to comply with the CPSC standards by a third party certification agency which conducts routine inspections of manufacturing facilities, and takes random samples of glazing products for periodic impact testing to make sure the products are being produced to the same quality as the materials initially certified to meet the safety glazing standards.

We were surprised to learn that wired glass isn’t considered a safety glazing material by the CPSC, but is classified as a safety glazing product under a voluntary safety glazing standard, ANSI Z97.1, developed by a Committee made up of primarily glazing producers, which has a lower impact test than the CPSC standard. We also found that wired glass products have never been certified by a third-party agency, such as SGCC, in compliance with ANSI Z97.1. According to the Chairman of ANSI Z97.1, wired glass products are “self-certified,” which means the products aren’t routinely inspected by a third-party certification agency, and random samples are not being selected by a third party agency for periodic testing every six months.

There is reason to question whether wired glass products sold on the open market and used in the United States actually pass the 100-ft. lb. impact test of ANSI Z97.1. Wired glass manufacturers have provided some test reports indicating the specimens that were tested passed the acceptance criteria specified by ANSI Z97.1. Wired glass representatives have indicated the test specimens submitted for these tests were selected by the manufacturer of the products. In contrast to these reports, there are test reports and other evidence that show wired glass products sold on the open market don’t meet the 100-ft. lb. impact test of ANSI Z97.1.

According to CPSC’s records, impact tests conducted by CPSC in connection with promulgation of the CPSC safety glazing standard back in 1977 showed that wired glass products did not meet the 100-ft. lb. impact test in ANSI Z97.1. In addition, test reports provided by a manufacturer of clear fire-rated glazing products show that impact tests of the four wired glass products sold in the U.S. were conducted in 1992 by an independent test agency, and none of the products met the ANSI Z97.1 impact test requirements. I personally witnessed the impact testing of two wired glass products conducted by an approved test agency on September 24, 2001, and both products failed to meet ANSI Z97.1 impact test criteria at the 100-ft. lb. impact level. For both the 1992 impact tests and the recent tests proponent witnessed, the test specimens were obtained from the open market. I also witnessed impact tests of wired glass products procured from three different sources that were conducted in February of this year in the presence of the Chairman of the ANSI Z97.1 Review Committee. There was a notable difference in the wire thickness in the different product specimens, but all of the specimens tested broke at 100-ft. lbs. When the test agency applied the 3” sphere to the openings, the results were mixed; one product failed, one product passed, and one product was subject to interpretation either way. The test results proved to us that there is a definite need for third party certification to address unacceptable performance resulting from the lack of quality control in production.

As a public safety advocate, ASGI is alarmed by the test failures of wired glass products sold on the open market, and views this as reliable evidence that current code practices for determining product compliance on the basis of self-certification aren’t effective. As it is right now, because wired glass manufacturers don’t voluntarily subscribe to a third-party certification program, code officials rely on self-certification by manufacturers as evidence of compliance, without any specific guidelines as to what information and test data should be included in a manufacturer’s certification for it to be accepted by a code official as reliable evidence that the product currently complies.

For example, if a manufacturer certifies compliance on the basis of tests conducted then years ago, is that an adequate evidence of compliance today? How about tests done one year ago? Six months ago? If tests were conducted by entities that aren’t approved test agencies, is that reliable evidence? Should the manufacturer be required to supply the test report as part of the certification? Should specific information be required to identify the specimens selected for testing, such as date of production, production facility, the specific run or lot selected, etc., which is relevant to determine whether the specimens are representative of standard production practices, or if they were selected from a special production run, referred to as “golden” run, for purposes of obtaining a higher quality product to submit as test specimens. These questions are answered by certification under a third party test program that requires routine inspections and selection of random samples for periodic testing by an approved test agency every six months. Certification provides assurance of continuous adherence of products to applicable safety standards.

One wired glass manufacturer, Pilkington, has supported third-party certification of wired glass overseas in the UK under the British safety glazing regulations as necessary to assure that the proper testing has been done and the product meets the standard required. Pilkington also makes a stronger wired glass product with thicker wires for the UK market that isn’t available in the U.S., and the wired glass product that’s certified to the British safety glazing standard is the stronger version with thicker wires.

We urge approval of S189-02 as submitted.

S199-02

Chapter 35

Proposed Change as Submitted:

Proponent: Standards writing organizations as listed

2002 ICC FINAL ACTION AGENDA 135
Revised as follows:

<table>
<thead>
<tr>
<th>Standard Reference Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>AF&amp;PA NDS-97-01</td>
<td>National Design Specification (NDS) for Wood Construction, and Supplement</td>
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<tr>
<td>AISC HSS (1997)</td>
<td>Specification for Steel Hollow Structural Sections</td>
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<tr>
<td>AISI</td>
<td>Specification for Cold-Formed Steel Framing, American Iron and Steel Institute/CSA/CANACERO</td>
</tr>
<tr>
<td>AITC</td>
<td>Standard Appearance Grades for Structural Glued Laminated Timber</td>
</tr>
</tbody>
</table>

**AF&PA**
American Forest and Paper Association / American
1111 19th St., NW Suite 800
Washington, DC 20036

**AISC**
American Institute of Steel Construction
One East Wacker Dr., Suite 3100
Chicago, IL 60601-2001

**AISI**
American Iron and Steel Institute
1101 17th St., N.W., Suite 1300
Washington, DC 20036-1700

**AITC**
American Institute of Timber Construction
Suite 140
7012 S. Revere Parkway
Englewood, CO 80112
<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
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<tr>
<td>A616/A616M-96A</td>
<td>Standard Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement</td>
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<tr>
<td>A617/A617M-96A</td>
<td>Standard Specification for Axle-Steel Deformed and Plain Bars for Concrete Reinforcement</td>
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<td>A653/A653M-00</td>
<td>Standard Specification for Steel Sheet, Zinc-Coated (Galvanized or Zinc-Iron Alloy-Coated) Galvannealed by the Hot-Dip Process</td>
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<td>A676/A676M-00</td>
<td>Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement</td>
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<td>Specification for Steel Wire, Plain, for Concrete Reinforcement</td>
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<td>A898/A898M-91</td>
<td>Specification for Straight Beam Ultrasound Examination for Rolled Steel Shapes</td>
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<td>A913/A913M-99</td>
<td>Specification for High-strength Low-alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-tempering Process (QST)</td>
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<tr>
<td>A706/A706M-99</td>
<td>Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement</td>
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<tr>
<td>A775/A775M-99</td>
<td>Specification for Epoxy-Coated Reinforcing Steel Bars</td>
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<td>C1002-99</td>
<td>Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases</td>
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<td>C1019-00</td>
<td>Standard Test Method of Sampling and Testing Grout</td>
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<tr>
<td>C1088-00</td>
<td>Specification for Thin Veneer Brick Units Made from Clay or Shale</td>
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<tr>
<td>C1157-00</td>
<td>Standard Performance Specification for Blended Hydraulic Cements</td>
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<tr>
<td>C1178/C1178M-99</td>
<td>Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel</td>
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<td>C1240-01</td>
<td>Specification for Silica Fume for Use as a Mineral Admixture in Hydraulic-Cement Concrete, and Mortar and Grout</td>
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<td>C1278/C1278M-99</td>
<td>Specification for Fiber-Reinforced Gypsum Panels</td>
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<td>C1314-02</td>
<td>Standard Test Method for Compressive Strength of Construction and Testing Masonry Prisms Used to Determine Compliance with Spedified Compressive Strength of Masonry</td>
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<td>C1395/C1395M-98</td>
<td>Standard Specification for Gypsum Ceiling Board</td>
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<td>Standard Test Methods Sampling and Testing Concrete Masonry Units</td>
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<td>C0150-91</td>
<td>Specification for Portland Cement</td>
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<td>C0216-91A</td>
<td>Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)</td>
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<td>C0270-91A</td>
<td>Standard Specification for Mortar for Unit Masonry</td>
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<td>Specification for Clay Flue Linings</td>
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<td>C033-99E01</td>
<td>Specification for Concrete Aggregates</td>
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<td>C0442/C0442M-99</td>
<td>Standard Test Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete</td>
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<td>C0442/C0442M-99A</td>
<td>Specification for Gypsum Backing Board and Coreboard</td>
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<td>C0474-97</td>
<td>Standard Test Methods for Joint Treatment Materials for Gypsum Board Construction</td>
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<td>C0475-94</td>
<td>Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Wallboard</td>
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<td>C0503-99E01</td>
<td>Specification for Marble Dimension Stone (Exterior)</td>
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<td>C0514-96</td>
<td>Standard Specification for Nails for the Application of Gypsum Board</td>
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<tr>
<td>C0665-01A</td>
<td>Specification for Concrete Brick</td>
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C0588/C0588M-00
Standard Specification for Gypsum Base for Veneer Plasters

C0595-01
Specification for Blended Hydraulic Cements [CEMENT]

C0618-01
Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

C0662-01
Standard Specification for Building Brick (Solid Masonry Units Made for Clay or Shale)

C0630/C0630M-00
Standard Specification for Water-Resistant Gypsum Backing Board

C0631-95A(2000)
Standard Specification for Bonding Compounds for Interior Gypsum Plastering

C0652-01A
Standard Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale)

C0667-02
Standard Test Methods of Sampling and Testing Brick and Structural Clay Tile

C0685/C0685M-00
Specification for Concrete Made by Volumetric Batching and Continuous Mixing

C0840-01
Specification for Application and Finishing of Gypsum Board

C0847-0000
Standard Specification for Metal Lath

C0887-99A(2001)
Specification for Packaged, Dry Combined Materials for Surface Bonding Mortar

C0897-00
Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters

C0991-01
Specification for Masonry Cement

C0933-95A(2001)
Standard Specification for Welded Wire Lath

C0094/C0094M-00E02
Specification for Ready-Mixed Concrete

C0946-91A(2001)
Specification for Practice for Construction of Dry-Stacked, Surface-Bonded Walls

C0955-01
Standard Specification for Load-Bearing Transverse and Axial Steel Studs, Runners, TTracks), and Bracing or Bridging; for Screw Application of Gypsum Panel Products and Metal Plaster Bases

C0036/C0036M-00
Standard Specification for Gypsum Wallboard

C0037/C0037M-01
Standard Specification for Gypsum Lath
Committee Action: Approved as Modified

Modify ASTM standards proposed for updating as follows:

- A706/A706M-04  00
- C33-04 e 99a  1
- C94/C94M-02  00
- C150-04  99a
- C595-04  00
- C618-04  99
- C685/C685M-04  98a
- C1157-04 e 00
- C1240-04 e 00  1

Modify ASTM standards not proposed for updating as follows:

- C31/C31M-99  98
- C330-99  99

Committee Reason: Agreement with the published reason. The modification addresses a concern raised by PCA that the proposed updates to ASTM standards which are referenced in Chapter 19 should be consistent with the version of the standard adopted by ACI 318-02 to avoid unintentional modifications to the intent of ACI 318. It was also the intention that these modifications be applicable only to concrete references (see staff note).

Staff note: Since the scope of the modification is applicable only to concrete references, several of the standards which are referenced for materials other than concrete, will have a second listing in Chapter 35 for those materials with the date of the standard as originally proposed.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.
Public Comment:

Garret Stone, Brickfield, Burchette, Ritts & Stone, PC; representing Cardinal Glass Industries requests Approved As Modified by this comment.

Modify proposal as follows:

Add the following to the list of ASTM standards to be updated:

- E1300-02 Standard Practice for Determining Load Resistance of Glass in Buildings

Remainder of standards updates as previously approved.

Commenter's Reason: We propose modifying the list of revised reference standards that the Committee approved at the spring hearings by adding the recently revised and updated ASTM standard for determining the load resistance of glazing in buildings pursuant to the requirements in Chapter 24 of the IBC. The IBC currently references ASTM E 1300-98 for determining load resistance of glazing. This 1998 version has now been superseded by ASTM E 1300-02, which is the most up-to-date version. To the degree possible, the most updated standards should be included in the I-codes before they are published.

The new 2002 standard was submitted to the ASTM Performance of Buildings Committee (the committee with jurisdiction over this standard) for approval in January of 2002, but due to the unavoidable lengthy balloting process, a final approval vote was not completed until June. As a result, the updated standard was not available to be considered in the spring ICC code hearings. Because the approval process has now been finalized, the new standard will be available for use in the fenestration industry prior to publication of the 2003 IBC. Thus, we believe that the voting members of the ICC should take this opportunity to add the new version of the standard to the 2003 edition of the IBC. We have included a copy of the new ASTM E 1300-02 standard with this Public Comment.

It is particularly important that this new version of the standard be included in this code cycle because it contains much-needed improvements to make it conform with the current IRC and IBC requirements for glazing in buildings. Specifically, ASCE-7 and the charts of basic wind speeds for the U.S. found in Chapter 3 of the IRC and Chapter 16 of the IBC, which are used to determine the appropriate loads for glazing in buildings, are based upon 3-second gust wind speeds. However, ASTM E 1300-98 was based upon glazing subject to 60-second duration wind load. One of the primary reasons for the modifications to the E 1300 standard in the 2002 edition was to correct this disconnect. The new standard is now based upon 3-second duration wind load, which will match the 3-second gust wind speeds in ASCE-7 (and in the IRC and IBC). The new standard also encompasses glazing systems with two, three, or four sided support, whereas the old standard only included charts for glazing systems with four sided support and required a full engineering analysis for anything less than four sided support. Most importantly, the new standard provides a far more precise method for determining the load resistance of laminated glass. Because the new standard is more precise, manufacturers will have far more flexibility in designing units that are able to meet the current code requirements for glazing loads, which in turn will benefit consumers through a wider range of product offerings and customer choice.

Window and glazing manufacturers are currently beginning the transition to the new 2002 ASTM standard. If this new standard is not included in the IBC during this cycle, it may not be printed in the final version of the I-codes until the 2006 edition, despite it being ready for adoption now. Manufacturers will test according to this standard and will likely have products available on the market by the time the 2003 codes are published (and certainly by the time the new codes are adopted). Failing to adopt the new standard at this time will only harm consumers and manufacturers because effective and available products meeting the ASTM standard will be arbitrarily excluded by the I-codes. We urge the ICC voting members take advantage of this opportunity to add the updated 2002 standard to the list of revised reference standards in S199-02.
INTERNATIONAL BUILDING CODE - FIRE SAFETY

FS13-02
503.2, 702, 705

Proposed Change as Submitted:

Proponent: Sarah A. Rice, C.B.O., Schirmer Engineering Corp.

1) Add new text as follows:

SECTION 702
DEFINITIONS

PARTY WALL. A fire wall on an interior lot line used or adapted for joint service between two buildings.

2) 202 DEFINITIONS

PARTY WALL. See Section 702.1.

3) Delete without substitution:

503.2 Party walls. Any wall located on a property line between adjacent buildings which is used or adapted for joint service between the two buildings, shall be constructed as a fire wall in accordance with Section 705, without openings and shall create separate buildings.

4) Revise as follows:

SECTION 705
FIRE WALLS

705.1 General. Each portion of a building separated by one or more fire walls or party walls that comply with the provisions of this section shall be considered a separate building. The extent and location of such fire walls and party walls shall provide a complete separation. Where a fire wall also separates groups that are required to be separated by a fire barrier wall, the most restrictive requirements of each separation shall apply. Fire walls located on property lines shall also comply with Section 503.2. Such fire walls (party walls) shall be constructed without openings.

705.2 Structural stability. Fire walls and party walls shall have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall for the duration of time indicated by the required fire-resistance rating.

705.3 Materials. Fire walls and party walls shall be of any approved noncombustible materials.

   Exception: Buildings of Type V construction.

705.4 Fire-resistance rating. Fire walls and party walls shall have a fire-resistance rating of not less than that required by Table 705.4.

   TABLE 705.4
FIRE WALL AND PARTY WALL FIRE-RESISTANCE RATINGS

foot notes:

a. Fire walls and party walls shall be not less than 2-hour fire-resistance rated where separating buildings of Type II or V construction.

b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5.

(No changes to table)

705.5 Horizontal continuity. Fire walls and party walls shall be continuous from exterior wall to exterior wall and shall extend at least 18 inches (457 mm) beyond the exterior surface of exterior walls.

Exceptions:

1. Fire walls and party walls shall be permitted to terminate at the interior surface of combustible exterior sheathing or siding provided the exterior wall has a fire-resistance rating of at least 1 hour for a horizontal distance of at least 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls shall be protected by fire assemblies having a fire-protection rating of not less than 3/4 hour.

2. Fire walls and party walls shall be permitted to terminate at the interior surface of noncombustible exterior sheathing, exterior siding or other noncombustible exterior finishes provided the sheathing, siding, or other exterior noncombustible finish extends a horizontal distance of at least 4 feet (1220 mm) on both sides of the fire wall.

3. Fire walls and party walls shall be permitted to terminate at the interior surface of noncombustible exterior sheathing where the building on each side of the fire wall is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

705.5.1 Exterior walls. Where the fire wall or party wall intersects the exterior walls, the fire-resistance rating for the exterior walls on both sides of the fire wall or party wall shall have a 1-hour fire-resistance rating with
shall be permitted to terminate at the

The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet (1220 mm) on each side of the intersection of the fire wall to exterior wall. Exterior wall intersections at fire walls and party walls that form an angle equal to or greater than 180 degrees (3.14 rad) do not need exterior wall protection.

705.5.2 Horizontal projecting elements. Fire walls and party walls shall extend to the outer edge of horizontal projecting elements such as balconies, roof overhangs, canopies, marquees and architectural projections that are within 4 feet (1220 mm) of the fire wall.

Exceptions:
1. Horizontal projecting elements without concealed spaces provided the exterior wall behind and below the projecting element has not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting element on both sides of the fire wall or party wall. Openings within such exterior walls shall be protected by fire assemblies having a fire-protection rating of not less than 3/4 hour.
2. Noncombustible horizontal projecting elements with concealed spaces, provided a minimum 1-hour fire-resistance-rated wall extends through the concealed space. The projecting element shall be separated from the building by a minimum of 1-hour fire-resistance-rated construction for a distance on each side of the fire wall or party wall equal to the depth of the projecting element. The fire wall or party wall is not required to extend under the projecting element where the building exterior wall is not less than 1-hour fire-resistance-rated for a distance on each side of the fire wall or party wall equal to the depth of the projecting element. Openings within such exterior walls shall be protected by fire assemblies having a fire-protection rating of not less than 3/4 hour.
3. For combustible horizontal projecting elements with concealed spaces, the fire wall or party wall need only extend through the concealed space to the outer edges of the projecting elements. The exterior wall behind and below the projecting element shall be of not less than 1-hour fire-resistance-rated construction for a distance not less than the depth of the projecting elements on both sides of the fire wall. Openings within such exterior walls shall be protected by fire assemblies having a fire-protection rating of not less than 3/4 hour.

705.6 Vertical continuity. Fire walls and party walls shall extend from the foundation to a termination point at least 30 inches (762 mm) above both adjacent roofs.

Exceptions:
1. Stepped buildings in accordance with Section 705.6.1.
2. Two-hour fire walls and party walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab provided:
   2.1. The lower roof assembly within 4 feet (1220 mm) of the fire wall or party wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
   2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall or party wall.
3. Each building shall be provided with not less than a Class B roof covering.
4. In buildings of Type I or II construction, fire walls and party walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck, or slabs where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall or party wall.
5. In buildings of Types III, IV and V construction, fire walls and party walls shall be permitted to terminate at the underside of noncombustible roof sheathing or decks where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
6. In Groups R-2 and R-3 as applicable in Section 101.2, fire walls and party walls shall be permitted to terminate at the underside of fire-retardant-treated wood within 4 feet (1220 mm) of each side of the fire wall or party wall where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
7. The roof sheathing or deck is constructed of approved noncombustible materials or of fire-retardant-treated wood for a distance of 4 feet (1220 mm) on both sides of the wall, or
8. The roof is protected with 5/8 inch (15.9 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a minimum distance of 4 feet (1220 mm) on both sides of the fire wall or party wall.
9. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall or party wall, and
10. The roof is covered with a minimum Class C roof.
7. Buildings located above a parking garage designed in accordance with Section 508.2(1) shall be permitted to have the fire walls and party walls for the buildings located above the parking garage extend from the horizontal separation between the parking garage and the buildings.

705.6.1 Stepped buildings. Where a fire wall serves as an exterior wall for a building and separates buildings having different roof levels, such fire wall or party wall shall terminate at a point not less than 30 inches (762 mm) above the lower roof level, provided the exterior wall for a height of 15 feet (4572 mm) above the lower roof is not less than 1-hour fire-resistance-rated construction from both sides with openings protected by assemblies having a 3/4-hour fire protection rating.

Exception: Where the fire wall or party wall terminates at the underside of the roof sheathing, deck or slab of the lower roof, provided:
1. The lower roof assembly within 10 feet (3048 mm) of the fire wall or party wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
2. Openings in the lower roof shall not be located within 10 feet (3048 mm) of the fire wall.

705.7 Combustible framing in fire walls. Adjacent combustible members entering into a concrete or masonry fire wall or party wall from opposite sides shall not have less than a 4-inch (102 mm) distance between embedded ends. Where combustible members frame into hollow walls or walls of hollow units, hollow spaces shall be solidly filled for the full thickness of the wall and for a distance not less than 4 inches (102 mm) above, below and between the structural members, with noncombustible materials approved for fireblocking.

705.8 Openings. Each opening through a fire wall or party wall shall be protected in accordance with Section 714.2 and shall not exceed 120 square feet (11 m²). The aggregate width of openings at any floor level shall not exceed 25 percent of the length of the fire wall or party wall.

Exceptions:
1. Openings are not permitted in party walls constructed in accordance with Section 503.2.
2. Openings shall not be limited to 120 square feet (11 m²) where both buildings are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

705.9 Penetrations. Penetrations through fire walls and party walls shall comply with Section 711.
Commenter’s Reason: The committee’s reason for not supporting this proposal was that “…party walls serve an additional purpose— that of joint service. As such, it is appropriate for the code to differentiate between the two [party walls and fire walls].”

Whether or not that statement is true is debatable. By definition the ONLY difference between the a “party wall” and a “fire wall” is the location of the wall. A party wall will be on an interior “lot line” where a “fire wall” won’t be on a “lot line.” But in this day of condomization, the fact that there is a true “lot line” means little any more.

A single structure may be constructed on a single lot, i.e., no interior lot lines. Because of size it has to be broken up into multiple “buildings” by the use of fire walls. The space between each fire wall is sold to separate and independent companies, e.g., the condo concept.

We are hard pressed to find the life safety, fire protection or structural problem here. How is this condition different that if it were multiple buildings separated by interior lot lines? NONE.

We ask that the membership of ICC to reconsider this issue and accept Code Change FS13-02.

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FS23-02

707.7

Proposed Change as Submitted:

Proponent: Gregory J. Cahanin, Cahanin Fire Code Consulting; representing Building Performance Research Institute

Revise as follows:

707.7 Openings. Openings in a shaft enclosure shall be protected in accordance with Section 714 as required for fire barriers. Such openings shall restrict the movement of smoke through openings in accordance with 714.2.3 and shall be self-closing or automatic closing by smoke detection.

Proponent’s Reason: The revision to 707.7, as proposed, vertically isolates floors by requiring opening protectives first by referencing 714 generally and then specifically citing the need for restricting the movement of smoke by reference to 714.2.3. Compartments can be compromised by smoke movement into the vertical shafts from fires on other floors where the provisions of 714.2.3 are not clearly delineated.

Technical substantiation for this change is found in NFIRS statistics (for a 10 year period) which found that sprinklered high-rise building fires had smoke extension beyond the room of fire origin 31 percent of the time and smoke extension beyond the floor of origin 11 percent of the time.

For non-residential fires 20 of 39 combined deaths or injuries occurred where flame damage extended beyond the room of origin to another floor. The revision of the Opening requirements as proposed will help to insure that smoke migration from one compartment to another is limited in multistory buildings where immediate awareness of a fire condition may not always be available and where firefighting efforts will be focused primarily in the compartment of fire origin.

Committee Action: Disapproved

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Committee Reason: A reference to Section 714.2.3 implies a requirement for a 20 minute opening protection rating for a shaft enclosure which may have up to a 2 hour rating. It is unclear as to exactly which provisions of Section 714.2.3 are to be held in compliance.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory J. Cahanin, Cahanin Fire Code Consulting, representing Building Performance Research Institute, requests Approved as Modified by this comment.

Modify proposal as follows:

707.7 Openings. Openings in a shaft enclosure shall be protected in accordance with 714 as required for fire barriers. Such openings shall restrict the movement of smoke through openings in accordance with Section 710.5.2, 714.2.3 and shall be self-closing or automatic closing by smoke detection in accordance with 710.5.3.

Commenter’s Reason: This revised change comment incorporates referencing to the 2002 supplement changes that added a new section on smoke partitions and effectively separated the IBC 2000 Section 714.2.3 provisions which combined test requirements for smoke ratings in the same paragraph with fire testing of 20 minute doors.

The 710.5.2 reference now clearly stipulates that smoke doors are to be tested under UL 1784. The 710.5.3 reference is needed to embrace the self-closing provision “where required elsewhere” language.

The opening requirement for as stated in the 2000 IBC under 707.7 while addressing fire barriers in the first sentence embraced the use of smoke detection to close the opening in the second. The inference in reading the section collectively is that the closure, not based upon heat activation, but smoke, is that the early protection of the opening is need for smoke as well as fire. The proposed change in language will therefore clarify the intent of isolating the elevator shaft from heat and smoke products. This is an important clarification to the Code.

In the November 1997 issue of the NFPA Journal, Dr. John Hall in the article, The Low-Down on High-rise Fires in Table 7 lists the extent of smoke beyond the room of origin on the floor of origin and beyond the floor of origin. The breakout by occupancy type shows smoke damage and thus smoke extension beyond the floor of origin ranged from as little as 5.2% of the fires in health care high-rise facilities to 17.1% of the fires in office high-rise buildings. For non-high-rise buildings smoke damage and thus smoke extension beyond the floor of origin ranged from 8.6% of the fires in health care facilities to a high or 34% of the fires in office buildings. Flame or fire damage extension for the same occupancies was typically 25% of the smoke extension percentages by occupancy.

The change, as proposed, will bring consistency to compartmentation requirements in the IBC as they relate to shaft enclosures and remove confusion over smoke versus heat protection requirements. The largest vertical openings in multi-story buildings consist of vertical shafts that require specific requirements for fire protection that includes limitations on the migration of smoke from the compartment of fire origin.
shall be provided with an elevator lobby. Elevator smoke partitions as defined in Section 710. Elevator smoke control systems were not present. They stated in the summary of a vertical shafts.

by a shielded fire represents a serious threat to life safety. Unless floor of origin in one of every seven fires. The NFPA data is determined that even in sprinklered buildings, smoke moved off the NFPA study of smoke and fire movement in multi story buildings 707.14.1 is to provide a barrier against vertical smoke migration. An the reported leakage between floors in buildings without smoke barriers are load of 30 or more, shall be provided with an elevator lobby at each floor containing such a corridor. The lobby shall completely separate the elevators from the corridor by fire barriers smoke partitions as defined in Section 710, and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions: (No change to current text)

Proponent’s Reason: The purpose of this change is to expand the lobby requirement beyond the current requirements, but to do so using the Smoke Partition concept approved in the last round of code hearings, and to tie requirements to occupancies where occupant population justify the increase in protection. The “I” codes presently tie the need for elevator lobby protection primarily to the presence of fire rated corridors (as was the case in the Uniform codes). However the presence of sprinklers significantly reduces the requirement for fire rated corridors, and by extension for elevator lobby protection.

The unprotected elevator hoistway opening remains the largest single source to allow vertical smoke migration representing 65% of the reported leakage between floors in buildings without smoke control systems. The primary purpose of the elevator lobby in 707.14.1 is to provide a barrier against vertical smoke migration. An NFPA study of smoke and fire movement in multi story buildings determined that even in sprinklered buildings, smoke moved off the floor of origin in one of every seven fires. The NFPA data is significant in that it identifies the need for increased smoke control at vertical shafts.

Tamura and Mawhinney of the NRC, studied smoke movement in sprinklered fires and conducted building tests where smoke control systems were not present. They stated in the summary of a 1994 ASHRAE paper—

“2. Under sprinklered but shielded conditions, fire continued to burn at a reduced burning rate and to produce smoke until the fuel inside the shielded area was consumed. Concentrations of CO2 and CO in the smoke were dangerously high.”

“7. The assumption that smoke will never become a threat to life safety in a fully sprinklered building needs to be reexamined.”

And in the body of the paper, the authors state”...smoke produced by a shielded fire represents a serious threat to life safety. Unless measures are taken to confine the smoke to the fire floor, smoke will spread through the building.”

The IBC currently requires smoke control systems in specific situations (atriums, underground buildings), and smoke barriers are not required in many instances beyond some limited I occupancy situations. In many previous hearings, most people acknowledge that even in sprinklered fires, smoke will be present and that the smoke will move in both unsprinklered and in sprinklered buildings to other compartments.

This change maintains the lobby requirement of the IBC, while extending the lobby requirement for other occupancies that will likely have occupant evacuation concerns during building evacuations (assembly, educational, institutional, mercantile, residential) but limits the lobby requirements to those occupancies that have large concentrations of people on the floor and where the people will need to use a corridor to escape. It also allows all lobbies to be built using the less restrictive requirements of the recently approved Smoke Partition language rather than as Fire Barrier construction.

Committee Action: Disapproved

Committee Reason: It is unclear as to the basis for the 30 occupant load threshold. The assumption is that the basis is the corridor ratings of Chapter 10 but the text is not clear as to whether this is a floor occupant load, building occupant load or elevator served occupant load. If the concern is smoke migration due to the elevator door, then maybe the focus should be on the elevator door.

Assembly Action: Approved as Submitted-Motion Failed

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Frank Hertzog, Smoke Safety Council, requests Approved as Modified by this comment.

Modify proposal as follows:

707.14.1 – Elevator Lobby. Elevators opening into a fire resistance rated corridor as required by Section 1004.3.2.1 and elevators opening into non rated corridors of Group A, E, I, M, and R occupancies with occupant loads of 30 or more, shall be provided with an elevator lobby at each floor containing such a corridor. The lobby shall completely separate the elevators from the corridor by smoke partitions as defined in Section 710. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions of this code.

Exceptions: (No change to current text).

Commenter’s Reason: This change as presented in Pittsburgh was defeated by an 8-7 vote of the committee, and has been modified to reflect the committee’s concerns. Comments of committee members during the spring hearing acknowledged that sprinklers do not necessarily prevent smoke migration and that smoke control is not generally required by the additional occupancies included in this change.

The separation of the elevator shaft from the floor using a lobby or the alternate means provided in the exceptions, is paramount in achieving floor-to-floor compartmentation consistent with the Section 701 scope requirement to separate adjacent spaces to safeguard against the spread of smoke and fire in a building. Compartmentation of each floor is achieved clearly in other sections of the IBC that address penetrations and construction of barriers and partitions, yet nothing is being done in many cases for the largest penetration.
Studies of smoke migration in sprinklered multi-story buildings show that smoke moves off the floor of origin in 1 of 7 fires. The unprotected elevator opening remains the largest single source to allow vertical smoke migration. Indeed many have asked why it is so important to protect many small utility openings when the biggest hole between floors is left unprotected.

The additional occupancies covered by this code change are occupancies where people are less likely to be familiar with the safe egress paths and additional occupant protection is justified. This change will provide extra time for safe egress by keeping the smoke generated to a single floor which will support more orderly evacuations, as well as making the Firefighters job easier by limiting the products of combustion to a single floor.

The use of the Smoke Partition concept approved in 2001 and referenced in the 2002 Supplement will minimize the cost of these lobbies protection while adhering to the scope requirements of 701.

**FS26-02**

**707.14.1 (Supp)**

**Proposed Change as Submitted:**

**Proponent:** Ralph W. Jones III, CBO, City of Lake Mary, Florida; representing SBCCI ICC-Fire Safety Code Action Committee

**Revise as follows:**

707.14.1 (Supp) *Elevator lobby.* Elevators opening into a fire resistance rated corridor as required by Section 1004.3.2.1 serving a Group R-1 or Group I Occupancy having an occupant load of 10 or more, or serving other occupancies having an occupant load of 30 or more shall be provided with an elevator lobby at each floor containing such a corridor. The lobby shall completely separate the elevators from the corridor remainder of the floor by 1-hour fire barriers and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

**Exceptions:**

1. (No change to current text).

2. (No change to current text)

3. Where additional doors are provided in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.

4. In other than Group I-3, and buildings more than four stories above the lowest level of fire department vehicle access, lobby separation is not required where the building, including the lobby and corridors leading to the lobby, is protected by an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2.

**Propponent’s Reason:** Elevator hoist ways are the single largest floor-to-floor openings in buildings. Smoke and other products of combustion are known to migrate to areas not directly involved in a fire scene. This smoke and other products of combustion are not eliminated by the presence of a fire sprinkler system. Means of egress are sized only for exiting a single floor; therefore, products of combustion should be limited from migrating to other floors. A means to control the migration of these products of combustion from floor to floor is essential to providing safe egress to occupants in a building involved in a fire.

**Exception 3** references Section 3002.6. Section 3002.6 is a prohibition of doors other than hoist way doors leading into the elevator car. It does not provide equivalence to an elevator lobby, and therefore should not be included as an exception.

**Exception 4** has been modified to limit the requirement to buildings four stories or higher. As it was written the requirement would only be evoked in five story buildings (four stories above the fire department vehicle access). Also at last years hearings, there was a question raised about what happens if there is no corridor leading to the lobby. The revision to the second part of the exception would clarify that the whole building shall be sprinklered to qualify for the exception.

**Analysis:** The difference between this proposal and FS27-02 is the revisions to Exception 4.

**Committee Action:** Disapproved

**Committee Reason:** See the reason for the disapproval of FS25-02 relative to occupant load. If the concern is smoke migration, a fire resistance rated barrier may not be the solution.

**Assembly Action:** No Motion

**Individual Consideration Agenda:**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Ralph W. Jones, III, City of Lake Mary, representing SBCCI IBC-FS Code Action Committee, requests Approved as Modified by this comment.

**Modify proposal as follows:**

707.14.1 Elevator Lobby. Elevators serving a Group R-1 or Group I Occupancy having an occupant load of 40 or more, per floor, or serving other occupancies having an occupant load of 50 or more, per floor, shall be provided with an elevator lobby at each floor. The lobby shall completely separate the elevators from the remainder of the floor by 1-hour fire barriers and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions of this code.

**Exceptions:**

1. No change

2. No change

3. In buildings other than Group I-3 and no more than three stories above the lowest level of fire department vehicle access,
lobby separation is not required where the building is protected by an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2. This exception applies to all occupancy groups other than Group I-3.

**Commenter’s Reason:** Elevator hoist ways are the single largest floor-to-floor openings in buildings. Smoke and other products of combustion are known to migrate to areas not directly involved in a fire scene. Means of egress are sized only for exiting a single floor; therefore, products of combustion should be limited from migrating to other floors. A means to control the migration of these products of combustion from floor to floor is essential to providing safe egress to occupants in a building involved in a fire.

In Pittsburgh there was a number of questions about how the occupant trigger was derived. I utilized the old trigger for rated corridors out of the Standard Building Code. After further analysis, I feel that trigger was overly restrictive. The next logical trigger, in my opinion, is the occupant content of an assembly or 50 people, however when I applied that criteria to residential and Institutional occupancies, the per floor space seemed too liberal, so I choose 30. As an example, Office buildings with a per floor area over 5000 square feet or residential buildings with a per floor area of over 6000 square feet would be subject to the elevator lobby requirement.

While I was tempted to change the proposal to require smoke partitions instead of fire barriers, I feel that the current requirements for smoke barriers do not address some of the potential hazards associated with smoke migration. For example section 710.5, openings says: windows shall be sealed to resist free passage of smoke or be automatic-closing upon detection of smoke. What it leaves out is what materials these windows can be constructed of. For example, a vinyl window probably meets the requirements of this section, however, in the case of fire impingement, that material would be useless.

Exception 3 references section 3002.6. Section 3002.6 is a prohibition of doors other than hoist ways doors leading into the elevator car. It does not provide equivalence to an elevator lobby, and therefore should not be included as an exception.

Exception 4 was modified by the revision committee in 1999 in FS86-99. Their intent was to omit the requirement for elevator lobbies in buildings that are no more than four stories above fire department access. As written the exception would require lobbies in buildings under four stories above fire department vehicle access. This modification is submitted to clarify the intent of the revision committee.

The reason for the committee modification to FS86-99 is as follows: The potential for smoke migration via the stack effect is reduced by the presence of a sprinkler system. It must be noted that smoke migration through the lobby may still occur since the lobby separation is a fire barrier and not a smoke barrier. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

**Exceptions:**

1. In office buildings, separations are not required from a street floor elevator lobby provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.

2. Elevators not required to be located in a shaft in accordance with Section 707.2.

3. Where additional doors are provided in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.

4. In other than Group I-3, and buildings more than four stories above the lowest level of fire department access, lobby separation is not required where the building, including the lobby and corridors leading to the lobby, is protected by an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2.

**Proponent’s Reason:** Over the years, the advocates for elevator lobbies in the IBC have typically justified the requirement based on essentially 2 lines of reasoning...

**Proposed Change as Submitted:**

**Proponent:** Sarah A. Rice, C.B.O, Schirmer Engineering Corp.

**Delete without substitution:**

707.14.1 (Supp) Elevator lobby: Elevators opening into a fire-resistance-rated corridor as required by Section 1004.3.2.1 shall be provided with an elevator lobby at each floor containing such a corridor. The lobby shall completely separate the elevators from the corridor by fire barriers and the required opening protection. Elevator lobbies shall have at least one means of egress.

The IBC in Section 1005.3.2 allows an “exit” stairways, the most pivotal egress elements in a building to be unenclosed when it connect only 2 floors. And yet, if there were an elevator in the same building, the provisions of 707.14.1 require it to have essentially 2...
levels of enclosure, the elevator shaft and a lobby. The current requirement for elevator lobbies is not consistent with the IBC with regard to the level of protection afforded floor openings and penetrations.

We urge the ICC membership to re-examine this issue thoroughly.

Committee Action: Disapproved

Committee Reason: The deletion of the elevator lobby provisions will result in a reduction in protection currently provided in the IBC. The proposal lacks justification to remove these provisions. These areas also provide a staging area for fire fighters.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Matthew D. Dobson, National Association of Home Builders, requests Approved as Submitted.

Commenter’s Reason: The proponent has offered substantial information and statistical data on elevator lobbies. The proponent’s previous proposals have offered an abundance of additional statistical information that shows many buildings in the east constructed under the BOCA National Building Code have been built without this requirement with no negative impacts.

Additionally, the current proposal states that the use of these lobbies for smoke mitigation and fire service staging areas are not essential. Fire Departments do not rely on the elevator lobby for staging fires and smoke mitigation is better addressed through different means as required in portions of Chapter 7 and Chapter 9 of the IBC.

We urge the members to approve as submitted FS30-02.

Public Comment 2:

Sarah Rice, Schirmer Engineering Corp., requests Approved as Submitted.

Commenter’s Reason: The committee’s reason for not supporting this proposal was that “The deletion of the elevator lobby provisions will result in a education in protection currently provided in the IBC. The proposal lacks justification to remove these provisions. These area also provide a staging area for fire fighters.”

We respectfully, but strongly disagree with the Committee’s Reason statement.

In regard to the first statement - “The deletion of the elevator lobby provisions will result in a reduction in protection currently provided in the IBC.” To make this kind of a statement is surprising since it hasn’t been clearly established as to what level of protection an elevator lobby provides. This we feel is the heart of the discussion.

Whether or not an elevator lobby does provide some necessary level of protection has been an on-going discussion since the incorporation of this provision in the IBC. If the protection afforded by an elevator lobby to a floor penetration is so important then why does the code only have this level of protection to openings in the floor made by elevators and not to openings for exits, escalators, non- required stairs, penetrations or other convenience openings.

It is hard to accept that the elevator lobby is such an integral protection method when Section 1005.3.2 allows 100% of a buildings “exit” stairways, the most pivotal egress elements in a building, to be unenclosed, e.g., be big holes in the building. And yet, if there were an elevator in the same building, the provisions of 707.14.1 require it to have essentially 2 levels of enclosure, the elevator shaft and a lobby. The current requirement for elevator lobbies is not consistent with the IBC with regard to the level of protection afforded floor openings and penetrations.

With regard to “lack of justification”, we should then go back to the drafting stages of the IBC when the Fire Safety Code Development Committee incorporated this provision. The requirement for elevator lobbies, as it appears in the IBC, was introduced to the committee unaccompanied by any technical documentation to support the concept. Though 2 of the 3 model codes at that time required elevator lobbies to some extent, none was to the extent now found in the IBC. What technical justification was presented to require something above and beyond what was in the model codes at the time of development? NONE! And none has been presented since to justify the need. The burden is to produce documentation to justify why it’s not needed.

We could have included numerous tables and charts of statistics, as we have done in the past 2 code development cycles, that showed how there is no fire data that supports the need for elevator lobbies. Particularly in fully sprinklered buildings, regardless if a corridor is fire rated or not. As the membership had seen those pieces of data many times we felt it would be redundant to do so again. Should anyone be interested in copies of the documentation we have, please feel free to contact us.

Last, with regard to the statement that “These area also provide a staging area for fire fighters.” We beg to differ with the Committees interpretation of the information they heard on this subject. Numerous fire fighters have gotten up in the past years and stated that they DO NOT use an elevator lobby as a staging area, and at the 2001 Code Development Hearings in Cincinnati even the opponents of this proposal acknowledged that elevator lobbies are not intended for fire fighter staging.

If one listed to the testimony presented in Pittsburgh on the Code Changes that immediately preceded Code Change FS30-02 (FS25-02 though FS29-02) and on G58-02, the case for accepting FS30-02 to entirely eliminate the requirement for elevator lobbies was made. The testimony that was heard on FS25-02, FS26-02, FS27-02, FS28-02 and FS29-02 spoke to a need to make the design criterion for elevator lobbies even more restrictive as the elevator shaft is, among other things, the biggest hole in the building so therefore must be protected. But how about all those other “big holes” that the IBC allows in a building, i.e., atriums, unenclosed access stairs, escalators, etc. Lobbies aren’t required around those features.

We do wish to point out that this same issue was recently discussed in depth before the NFPA membership. With many of the same people who testified to FS30-02 in Pittsburgh also speaking at the NFPA meeting. We will not even begin to reiterate all of the issues that have surrounded this topic, but found it very interesting that at the NFPA hearings a very interesting statement was made; a statement that basically contradicts all of the reasons the ICC membership have been given over the years to support the need for elevator lobbies. Essentially the statement was made that the issue of elevator lobbies in general is NOT one of life safety but rather for fire fighter staging. And yet, at the NFPA meeting fire fighters got up to testify that they DO NOT use the elevator lobbies for staging.

For those of you who have been following this issue over the last 3 years, the “reason” for requiring an elevator lobby has been the heart of the discussion. But in all of those discussions it was agreed that the elevator lobbies WERE NOT for fire fighter staging. Many fire fighters testified to the membership of ICC on this point. That left life safety as the reason for elevator lobbies. But now we have the same people are saying that life safety is NOT the reason for an elevator lobby. Then we must pose this simple question to the ICC membership...What IS the reason for an elevator lobby?

We ask that the membership of ICC give this issue serious reconsideration and accept Code Change FS30-02.
Proposed Change as Submitted:

Proponent: John Valiulis, P.E., HILTI, Inc.

Revise as follows:

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

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall do not require a T rating.
2. Floor penetrations consisting of either a pipe, tube, or conduit that are not in direct contact with combustible material do not require a T rating.

Propponent’s Reason: The proposed new exception is not a new concept, as it was contained in the National Building Code (1999) and the Standard Building Code (1999).

When a penetration firestop system is tested in accordance with ASTM E814 (UL 1479), both a fire resistance rating (F-rating) and a temperature resistance rating (T-rating) are assigned. The T-rating is an indication of how long the temperature of all thermocouples on the unexposed side, including thermocouples on the penetrating item, stay at a temperature that is less than 325°F above the initial temperature. When a metal penetrating item, such as a pipe, tube or conduit, is tested as part of the firestop system, the penetrating item quickly rises to more than 325°F above the initial temperature. This is obviously due to the very good thermal conductivity of metal. So with firestop systems involving a metal penetrating item, there typically is no T-rating obtained. As a way to satisfy the occasional requirement for a T-rating for the metal penetrants fire stopping system, insulation is provided on the penetrants, so that the thermocouple will not measure the high temperature of the penetrants during the ASTM test.

The proposed Exception No. 2 is simply recognition that in certain cases, it is unnecessary to mandate a foretop system that has been supplemented with insulation on the metal penetrants. That exception has existed for years in the NBC and the S.C. As a foretop system manufacturer and supplier within the NBC and S.C. jurisdictions, Hilti has not been made aware of any single incident whereby a foretop system for a floor with metal penetrants has caused any unacceptable performance during a fire.

This new exception recognizes an additional situation where a floor penetration foretop can be perfectly acceptable without a T-rating, as demonstrated by years of application without any adverse loss experience.

Committee Action: Disapproved

Committee Reason: The committee agrees with the intent of the proposal but has concerns with the proposed language. The proposal includes the term “direct contact” which may lead to interpretation questions.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Valiulis, P.E., HILT, Inc., requests Approved as Submitted by this comment.

Commenter’s Reason: As pointed out in the Public Proposal, the proposed exception, essentially verbatim, was part of the NBC (1999) and the S.C. (1999). The published Committee Reason for Disapproval of this Proposal was that the term “direct contact” could lead to difficulty in applying and interpreting the exception. In discussing this issue with a sampling of code officials from the NBC and S.C. jurisdictions, they were not aware of any historical problems in applying the wording of the exemption.

Without the proposed exception, the IBC is internally inconsistent in the way that it deals with the issue of metal pipes penetrating a fire-rated floor. In the existing 711.4.1.2, which deals with pipe penetrations sealed with specially engineered materials and systems tested and listed in accordance with ASTM E814, the pipe penetration must have a “T-rating” equal to the fire resistance rating of the assembly. This means that the penetrating item must not have a temperature rise of more than 325 F during the full duration of the fire test. For a metal pipe, which is inherently a good conductor of heat, getting a T-rating results in a requirement to insulate the pipe, usually above and below the floor. However, in the first two general exceptions to all of 711.4.1, it is indicated that for metal pipes, it is acceptable to seal the pipe penetrations with non-listed products (e.g. full thickness concrete, grout, or mortar), and using those exceptions, no T-rating is imposed on the sealing of the metal pipe penetration. Sealing a pipe penetration in those allowed ways would result in pipes which would clearly not pass a T-rating test.

If the code committee has decided that a T-rating is critical in all cases, then that requirement should have existed in the Exceptions to 711.4.1.2, but it does not. Otherwise, “reasonable” exceptions to the T-rating requirement should be considered in the case where specially engineered sealing materials and systems are being used, as proposed in this code change proposal.

It is felt that an exception to the T-rating is just such a “reasonable” exception when there is no contact with combustibles, as borne out by years of successful implementation within the NBC and S.C. jurisdictions. Without such an exception, the lack of any T-rating requirement for pipe penetration seals involving non-tested and non-listed products is significantly out of line with the absolute requirement for T-ratings when ASTM E814 tested and listed products are used to seal the pipe penetration.

FS38-02

711.5 (New), 711.6 (New), 712.5 (New)

Proposed Change as Submitted:
Proponent: Richard R. Licht, 3M Company

Add new text as follows:

SECTION 711 PENETRATIONS

711.5 Penetrations in corridors and smoke barrier walls. Penetrations in fire-resistance-rated corridor and smoke barrier walls shall meet the requirements of UL 1479 for air leakage. The Air Leakage rate of the penetration assembly shall not exceed 25.0 cfm per square foot (0.01524 m$^2$/3*m$^2$) of penetration opening for both the ambient temperature and elevated temperature tests.

711.6 Penetrations in corridors and smoke barrier horizontal assemblies. Penetrations in horizontal assemblies shall meet the requirements of Section 711.4. Penetrations shall also meet the requirements of UL 1479 for air leakage. The air leakage rate of the penetration assembly shall not exceed 25.0 cfm per square foot (0.01524 m$^2$/3*m$^2$) of penetration opening for both the ambient temperature and elevated temperature tests.

SECTION 712 JOINTS

712.5 Joints and corridors and smoke barriers. Joints shall meet the requirements of Section 712.3. Joints shall also meet the requirements of UL 2079 for air leakage. The air leakage rate of the joint shall not exceed 25.0 cfm per square foot (0.01524 m$^2$/3*m$^2$) of joint opening for both the ambient temperature and elevated temperature tests.

Purpose: Is to clarify the code language by providing new language and tests methods to the codes for smoke leakage for corridors and smoke barriers.

Proponent’s Reason: The code for smoke sealing penetrations and joints in smoke barriers but do not tell you how to measure smoke leakage or what type of testing is applicable. The addition of UL 1479 Air Leakage rating will provide a means of testing smoke leakage and give a value that can be used in total smoke leakage through a barrier containing penetrations. The addition of UL 2079 will also allow testing and measurement of smoke leakage through joints in smoke barriers. Both of these standards measure air leakage at room temperature as well at 400F, (Hot and Cold smoke). The air leakage test in UL 1479 and UL 2079 is based on the air leakage test for fire doors can provide the user with a quantified value for smoke leakage in corridors and smoke barriers. The language used today does not provide a test method or a measurement for smoke through these types of construction. Smoke leakage can then be related to the type of occupancy and where it is critical to reduce or eliminate the leakage of smoke or toxic gases and it can be measured. Control of smoke and toxic gases can be provided where people may have been difficult in egress and less control where it is necessary. The major smoke leakage in a smoke barrier is going to come from the openings left in the construction of these items by openings left for joints and penetrations. Walls are already classified by either being loose or tight based on the same type of air leakage testing. Smoke leakage standards exist for doors, windows and walls and they can all be included in the total smoke leakage through smoke barriers. The current code calls for doors in corridors and smoke barriers to have smoke leakage ratings. Section 714.2.3 establishes the leakage rate for doors and penetration seals should have the same requirement. Occupancy can then choose what level of smoke leakage would be allowable based on their need.

The total smoke leakage in a smoke barrier could be used in a fire hazard analysis and related to the time required for egress based on a calculation for determining the time to fill a smoke protected area (such as a corridor). Smoke and toxic gases are responsible for over 80% of the fatalities in fire in the US. Manufacturers rely on national standards for development of products as well as using standards for complying too the codes. These changes would make compliance to the codes possible as well as improving public safety.

These code changes would not add additional cost to the construction of buildings as smoke barrier and corridors already require fire protection seals to meet the fire-resistance requirements of the codes. Many of the manufacturers have fire rated seals that are also smoke rated. Many UL listed systems already provide smoke leakage ratings for both penetrations seals and joints in the fire resistance directory.

Supporting information: Fire creates an immediate pressure differential, and even a single 1/4-inch diameter opening in a wall or partition could allow an adjacent space to fill with life-threatening toxic gases in a matter of minutes. Elevated pressure forces hot gases through unsealed cracks and openings to create an immediate threat to building occupants. Table 1 shows flow through representative openings between building spaces based on a pressure differential of 75 Pa, which is representative of pressure differences that have been measured in actual compartment fires.

Table 1-Smoke Flow Through Barrier Openings. NFPA #SCHR-94

<table>
<thead>
<tr>
<th>Item</th>
<th>Gap</th>
<th>CFM</th>
<th>CFM/Ft.²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door (3’x7’)</td>
<td>.078&quot;</td>
<td>200</td>
<td>1810</td>
</tr>
<tr>
<td>Door (3’x7’)</td>
<td>.16&quot;</td>
<td>400</td>
<td>1769</td>
</tr>
<tr>
<td>Door (3’x7’)</td>
<td>.24&quot;</td>
<td>600</td>
<td>1794</td>
</tr>
<tr>
<td>Door (3’x7’)</td>
<td>.24&quot;</td>
<td>1.4</td>
<td>3</td>
</tr>
<tr>
<td>Door Elevator (3.5’x’ 7’)</td>
<td>.24&quot;</td>
<td>600</td>
<td>1333</td>
</tr>
<tr>
<td>Door Elevator (3.5’x’ 7’)</td>
<td>.31&quot;</td>
<td>1000</td>
<td>2215</td>
</tr>
<tr>
<td>Walls</td>
<td>Tight</td>
<td>---</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>---</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Loose</td>
<td>---</td>
<td>0.6</td>
</tr>
<tr>
<td>Joint no smoke seal</td>
<td>67&quot;</td>
<td>1800</td>
<td>1542</td>
</tr>
</tbody>
</table>
Smoke flow between spaces has substantial impact on visibility and life safety. For example, a 100-foot long, 8-foot high x 10-foot wide corridor adjacent to a smoke filled space, having an unsealed, top-of-wall joint of 0.67 inches wide and 20-feet long, would fill with smoke in three to five minutes. Table 2 shows the effect of sealing openings.

### Table 2 Calculated Time for Smoke to Fill a Corridor

<table>
<thead>
<tr>
<th>Item</th>
<th>CFM</th>
<th>Time to 100% Fill (8000 ft²) in minutes</th>
<th>Time to 50% Fill (8000 ft²) in minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tight Seal</td>
<td>3</td>
<td>2395</td>
<td>1197</td>
</tr>
<tr>
<td>Average Seal</td>
<td>50</td>
<td>143</td>
<td>71.5</td>
</tr>
<tr>
<td>Loose Seal</td>
<td>200</td>
<td>35.8</td>
<td>17.9</td>
</tr>
<tr>
<td>Loose Seal</td>
<td>400</td>
<td>17.9</td>
<td>8.9</td>
</tr>
<tr>
<td>No Seal</td>
<td>1857</td>
<td>3.9</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**Analysis:** The text proposed for Sections 711.5 and 711.6 may be better suited in Sections 711.3 and 711.4, respectively.

**Committee Action:** Disapproved

**Committee Reason:** Documentation of failures of fire stops is needed to support this proposal.

**Assembly Action:** Approved as Modified-

**Motion Failed**

**Individual Consideration Agenda:**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Tony Crimi, A.C. Consulting Solutions, Inc., representing International Foretop Council, requests Approved as Submitted.

**Commenter’s Reason:** To introduce code language which adds quantitative requirements and specific test methods to measure smoke leakage for penetrations and joints in corridors and smoke barriers.

**Substantiation:** The IBC currently includes requirements for doors in corridors and smoke barriers to be tested in accordance with a nationally recognized UL Standard (UL 1784) for the quantitative measurement of air leakage rates through door assemblies under prescribed conditions. In contrast, for smoke sealing penetrations and joints in smoke barriers, the code requires that they be installed, but provides no guidance or quantitative requirements on how to measure leakage rates, what type of testing is applicable, and what maximum quantity of leakage is acceptable. The addition of UL 1479 Air Leakage rating will provide a nationally recognized UL Standard for the quantitative measurement of air leakage rates through a barrier containing penetrations under prescribed conditions. Similarly, the addition of UL 2079 will also provide a nationally recognized UL Standard for the quantitative measurement of Air Leakage rates through a barrier containing joints, under prescribed conditions. The UL Directory identifies these ratings as “L” ratings, and contains literally hundreds of penetration and joint designs which have already been tested and assigned an “L” rating. Just as with UL 1784, both of these standards measure air leakage at room temperature as well as at 40°F, (representing hot and cold smoke). The air leakage tests conducted in UL 1479 and UL 2079 are based on the air leakage test for doors and can provide the user with a numerical value for smoke through penetrations and joints in smoke barriers. While a value of 25 cfm per square foot of penetration and/or joint has been proposed here, in future, these test methods could allow code committees to specify leakage rates related to specific occupancies. Stricter control of smoke and toxic gases can then be provided where people may have difficulty in egress, and lesser control where it is less crucial. In terms of area of openings and potential for smoke leakage, a single 4 ft by 8 ft door assembly represents the same opening size as a single 24 ft long by 16 inch wide joint located, for example, at the top of a wall. It is therefore likely that the major smoke leakage in a smoke barrier is going to come from the openings left in the construction for joints and penetrations. Walls are already classified as either being loose or tight based on the same type of air leakage testing. Smoke leakage standards exist for doors, windows and walls and they can all be included in the total smoke leakage through smoke barriers. Total smoke leakage in a smoke barrier could then be used in a fire hazard analysis and related to the time required for egress based on a calculation for determining the time to fill a smoke protected area (such as a corridor). Manufacturers rely on national standards for development of products as well as for use as a means of complying with the codes. These changes would both make compliance to the codes possible, and improve public safety. We believe that these code changes would not add additional cost to the construction of buildings as smoke barrier and corridors already require fire protection seals to meet the fire-resistance requirements of the codes, and most product manufacturers already have fire rated seals and joints that are also smoke (“L”) rated.

**Additional Supporting information:** Fire creates an immediate pressure differential, and even a single 1/4-inch diameter opening in a wall or partition could allow an adjacent space to fill with smoke and toxic gases in a matter of minutes. Smoke flow between spaces has substantial impact on visibility, egress and life safety. Elevated pressure forces hot gases through unsealed cracks and openings to create an immediate threat to building occupants. Pressure differentials of up to 75 Pa have been measured in actual fire compartments. Based on a pressure differential of 75 Pa, a 100-ft long by 8-ft high by 10-ft wide corridor adjacent to a smoke filled space, having an unsealed top-of-wall joint of 0.67 inches wide and 20-feet long, would completely fill with smoke in three to five minutes. The 25 cfm per square foot proposed here represents an average to tight seal which, under the same conditions described above, would delay the transfer of enough smoke to completely fill an adjacent 100-ft long by 8-ft high by 10-ft wide corridor by well in excess of 3 hours.

**FS40-02**

**712.4**

**Proposed Change as Submitted:**

**Proponent:** William E. Koffel, PE, Koffel Associates, Inc.; representing GICC
Revise as follows:

712.4 Exterior curtain wall/floor intersection. Where fire-resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an approved material. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire-conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period at least equal to the fire-resistance rating of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 704.9.

Proponent’s Reason: The proposal is to clarify that Section 712.4 only requires that the opening between the floor assembly and the exterior curtain wall be sealed in the plane of the floor to maintain the fire resistance rating of the floor to the exterior wall. The existing language has been interpreted to require closing of the void between the floor and the exterior wall along the fire rated spandrels or eyebrows to prevent the vertical spread of fire via the exterior from window to window. A requirement for a fire rated spandrel in all glass/aluminum curtain walls is not justified either by the existing provisions of the IBC or fire experience.

Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Matthias Mulvey, CBO, CET, Thermafiber, requests Disapproved.

Commenter’s Reason: Section 712.9 of the ICC International Building Code referenced in 712.4 does not adequately address maintaining fire safety at the perimeter joint of a building. Research by Thermafiber into the promulgation and changes to the so called “spandrel section” of the model codes shows that in 1968, the model codes required a 5’ protected spandrel area. There was no documentation on file to show if any testing was submitted to justify the 5’ height, or how it was to be constructed to maintain the integrity of the spandrel/perimeter joint. The protected spandrel height was reduced in the model codes from 5’ to 3” in 1970, again with no documentation submitted to show where the 3’ height was derived from. Industry testing over the last thirty years has proven time and again that a 3’ “protected” spandrel will not work to maintain the integrity of the perimeter joint.

Current testing has shown that to maintain a floor fire rating at the perimeter of a building, a fire rated assembly of materials placed in the wall and at the remaining gap in the floor or below and above the floor if a platform frame is used, is the only effective way to maintain floor integrity and building occupant safety for floors above a fire floor and allow for varied exterior wall finishes at the perimeter of a building. Current testing consistently shows that it takes approximately 6’ of an assembly more or less evenly spaced at the juncture of the floor slab and the outside wall to maintain a floor fire rating for 2-hours. In addition, the sprinkler system referenced in earlier model codes to gain the “sprinkler exception” trade-off and not even rate the spandrel for a 3’ area called for a water curtain to be in place (see earlier editions of NFPA 13 and reference document NFPA 80-A). NFPA 80-A deals with water sprinkler protection of buildings at exterior walls. Current editions of NFPA 13 do not require the incorporation of NFPA 80-A into the design of a sprinkler system. Water sprinkler testing done on exterior walls with expansive amounts of non-rated material including glazing conclude that a water curtain can keep an exterior wall cool for periods of time and that a standard NFPA 13 system will not. With over 245 test on perimeter joints of buildings done by numerous manufacturers of building materials showing that a 3’ and even a 5’ of a protected spandrel will not maintain fire safety at the perimeter of a building for 2-hours, it would appear that the current provisions of section 704.9 are to say the least dubious and give a false sense of security to building owners/occupants and regulatory officials. There are no systems available where one can only place a fire-retardant material at the gap at a perimeter joint. One only needs to look at the Interstate Bank fire of 1988 to see what type of damage occurs in high-rise building fires where there was a lack of concern for maintaining fire-rating integrity at perimeter joints.

FS42-02

714.2 (New)

Proposed Change as Submitted:


Add new text as follows:

714.2 Fire-resistance-rated doors. Labeled fire-resistance-rated door assemblies tested as part of a fire-resistance-rated wall assembly in accordance with ASTM E 119 shall not be required to comply with this section.

(Renumber remaining)

Proponent’s Reason: Section 714.3.8 already addresses fire-resistance-rated glazing and states that such materials need not comply with Section 714.3. There is no similar language addressing fire door assemblies that have been tested in accordance with ASTM E 119. These door assemblies are outside the scope of the reference standard, NFPA 80.

Editorial note: The proponent represents the “American Fire Door Manufacturers Association”.

Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because two public comments were submitted.

Public Comment 1:

Paul Hayward, City of Farmington, UT, representing Farmington City, requests Disapproved.

Commenter’s Reason: This provision, if approved, may well eliminate the “positive pressure” testing of fire doors. That is not a wise course of action.

Public Comment 2:

Gilbert Gonzales, Murray City Corp., representing Utah Chapter ICC, requests Disapproved.

Commenter’s Reason: This change removes the positive pressure test from fire doors. We should not continue making fire doors that may not pass the proper test.

FS43-02

714.2 (New)

Proposed Change as Submitted:


Add new text as follows:

714.2 Fire-resistance-rated glazing. Labeled fire-resistance-rated glazing tested as part of a fire-resistance-rated wall assembly in accordance with ASTM E 119 shall not be required to comply with this section.

(Renumber remaining)

Proponent’s Reason: Section 714.3.8 already addresses fire-resistance-rated glazing and states that such materials need not comply with Section 714.3. However, such glazing assemblies are not within the scope of NFPA 80 or any of the provision of Section 714.3. By inserting the requirement for labeling in the beginning of the proposed new section the provisions of Section 714.3.9 are also addressed. The more specific details of the label in Section 714.3.9 are already included in Section 1703.5. Companion changes have also been submitted to revise Section 714.3.8 and 714.3.9.

Editorial note: The proponent represents “Pilkington”.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gilbert Gonzalez, Murray City Corp., representing Utah Chapter ICC, requests Disapproved.

Commenter’s Reason: This change removes some requirements from glass installation requiring positive pressure on the fireside. It would not be appropriate.

FS75-02

Table 719.1(2)

Proposed Change as Submitted:


Add new text as follows:

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>ITEM NUMBER</th>
<th>CONSTRUCTION</th>
<th>MINIMUM FINISHED THICKNESS FACE-TO-FACE&quot; (inches) 1 Hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Wood studs-interior partition with gypsum wallboard each side</td>
<td>14-1.7</td>
<td>2&quot; x 4&quot; wood studs at 16&quot; on center with one layer of ½ inch Type X gypsum wallboard applied vertically on each side. Double top plates and a single bottom plate. Wallboard attached with 1 5/8” long galvanized cup head drywall nails at 7” on center with vertical edge joints over the wood studs. Horizontal cross-bracing at mid-height. Stud cavity filled with spray-applied cellulose insulation having a nominal density of not less than 2.5 lbs/cu. ft.</td>
<td>4 ½</td>
</tr>
</tbody>
</table>

Note: Table not shown in its entirety.
Proponent’s Reason: This proposal one-hour fire resistance rated gypsum wallboard wall assembly is intended to be included in Table 719.1 (2) as a generic 2 x 4 wood stud gypsum wallboard system using ½” Type X gypsum wallboard with the stud cavities filled with spray-applied cellulose insulation having a minimum nominal density of 2.6 lbs. per cu. ft. The fire resistance rating for this wall assembly was determined in accordance with ASTM E119 by Omega Point Laboratories in a report entitled: ASTM E119-1998 Fire Tests of Building Construction and Materials (Modified) Wood Stud Wall Insulated with Cellulose Insulation Project No. 16094-105449 dated December 21, 1999. This is the same fire test report that was provided to substantiate the use of cellulose insulation for the calculated fire resistance of one-hour walls using gypsum wallboard and wood studs in Code Change FS50-00. That code change was approved during the 2000 code change cycle.

The fire test report clearly shows that by filling the stud cavity with cellulose insulation, it is only necessary to use ½” thick Type X gypsum wallboard to achieve the one-hour fire resistance rating. This test is applicable to both load bearing and nonloading bearing wall assemblies.

Committee Action: Disapproved

Committee Reason: The submitted test reports indicate that the test sample was constructed of two unique designs, each less than the 100 square foot prescribed by ASTM E119. The test indicates a full scale rating can’t be given.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, P.E., The Code Consortium, Inc., representing Cellulose Insulation Manufacturers Association (CIMA), requests Approved as Modified by this comment.

Modify proposal as follows:

TABLE 719.1(2)
RATED FIRST RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS * * * *

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>ITEM NUMBER</th>
<th>CONSTRUCTION</th>
<th>MINIMUM FINISHED THICKNESS FACE-TO-FACE * * (inches) 1 Hr</th>
</tr>
</thead>
</table>

14. Wood studs-interior partition with gypsum wallboard each side 14-1.7 2” x 4” wood studs at 16” on center with one layer of ¼ inch Type X gypsum wallboard applied vertically on each side. Double top plates and a single bottom plate. Wallboard attached with 1 5/8” long galvanized cup head drywall nails at 7” on center with vertical edge joints over the wood studs. Horizontal cross-bracing at mid-height. Stud cavity filled with spray-applied cellulose insulation having a nominal density of not less than 2.6 lfs/cu. ft.

Commenter’s Reason: We are submitting this Public Comment to ask the voting membership to approve this Code Change as modified in accordance with this Public Comment. The modification is to change the minimum density of the cellulose insulation from 2.5 pounds per cubic foot to 2.6 pounds per cubic foot. All of the tests conducted on sprayed applied cellulose insulation have utilized a minimum nominal density of 2.6 pounds per cubic foot to achieve the desired fire resistance ratings.

The Committee’s reason for disapproving this code change was that they felt the tests we submitted were not adequate since they were not totally full scale fire tests based on ASTM E119 test procedures that require a minimum wall test size of 100 sq.ft. Although the fire test report showed a wall test size that was at least 100 sq.ft., the wall was divided into separate sections for comparison purposes so the test was not considered to be full scale by the testing lab. Therefore, in response to the Committee’s concerns, the Cellulose Insulation Manufacturers Association (CIMA) conducted a full scale test. This test was conducted subsequent to the deadline for the submittal of this Public Comment so we intend to make the report available to those who are interested in reviewing the test report. We also intend to provide it to the members of the IBC Code Development Committee for their review prior to the ICC Joint Annual Conference so that they can have an opportunity to offer any concerns they may have during the testimony on this Public Comment.

We would hope that the voting membership will approve this code change as modified by this Public Comment so that this 1-hour wall construction can be included in the 2003 edition of the International Building Code.

FS76-02

Table 719.1 (2)

Proposed Change as Submitted:


Revise as follows:

TABLE 719.1 (2) (Supp)
RATED FIRE RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS * * * *

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>ITEM NUMBER</th>
<th>CONSTRUCTION</th>
<th>MINIMUM FINISHED THICKNESS FACE-TO-FACE * * (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 hr.</td>
<td>3 hr.</td>
<td>2 hr.</td>
<td>1 hr.</td>
</tr>
</tbody>
</table>
Proponent’s Reason: This one-hour fire resistance rated gypsum wallboard wall assembly is included in Table 719.1 (2) as a generic 2 x 4 wood stud gypsum wallboard exterior wall system using 5/8" Type X gypsum wallboard with the stud cavities filled with mineral wool insulation. We are proposing to allow the stud cavities to also be filled with spray-applied cellulose insulation having a minimum nominal density of 2.6 lbs. per cu. ft. as an alternative. A similar wall assembly filled with cellulose insulation also achieved a one-hour fire resistance rating based on a test conducted in accordance with ASTM E 119 by Omega Point Laboratories in a report entitled: ASTM E119—1998 Fire Tests of Building Construction and Materials (Modified) Wood Stud Wall Insulated with Cellulose Insulation Project No. 16094-105449 dated December 21, 1999. This is the same fire test report that was provided to substantiate the use of cellulose insulation for the calculated fire resistance of one-hour walls using ½" thick Type X gypsum wallboard and wood studs in Code Change FS50-00. That code change was approved during the 2000 code change cycle.

The fire test report clearly shows that by filling the stud cavity with cellulose insulation, it is only necessary to use ½" thick Type X gypsum wallboard to achieve the one-hour fire resistance rating. The exterior wall assembly in the table utilizes 5/8" thick Type X gypsum wallboard to achieve the one-hour rating. Thus, the substitution of cellulose insulation is more than adequate to maintain the one hour fire resistance rating. This substitution is applicable to both load bearing and non-bearing wall assemblies.

Committee Action: Disapproved

Committee Reason: The tested assemblies in Table 719.1(2) of the Supplement reference footnote “q” which reflects a tested assembly at 100% of allowable f. The wall in question was not tested to this loading with the cellulose insulation.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter’s Reason: The purpose of this Public Comment is to request that the voting membership overturn the Committee’s recommendation for disapproval and approve the code change as submitted. The reason for this is the Cellulose Insulation Manufacturers Association (CIMA) has responded to the Committee’s reason for disapproval and has tested a 1-hour gypsum wallboard assembly using ½" Type X gypsum wallboard with the stud cavities filled with cellulose insulation. This wall assembly has been tested to the full 100% design stress for f. What this shows is that the 1-hour fire resistance rating is actually achieved with the help of the cellulose insulation so the installation of cellulose insulation in a wall assembly using 5/8" Type X gypsum wallboard should also be acceptable. In other words, the installation of the cellulose insulation in the wall cavities not only does not adversely affect the fire resistance rating, it, in fact, enhances the fire resistance rating.

The fire test was not conducted until after the deadline for submittal of this Public Comment, so we can not refer directly to the test report. However, the report will be made available to those individuals interested in reviewing it prior to or at the ICC Annual Joint Conference Code Hearings. We will also provide the test report to the members of the IBC Fire Safety Code Development Committee for their review prior to the hearings. Thus, if they have any concerns regarding the tests, they can make them known at the hearings. If they agree that the test method was conducted properly and the appropriate stress applied to the studs, then we believe this code change should be approved based on that full scale fire test.

FS77-02
Table 719.1 (2)

Proposed Change as Submitted:


Revise as follows:

TABLE 719.1 (2) (Supp)
RATED FIRE RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>ITEM NUMBER</th>
<th>CONSTRUCTION</th>
<th>MINIMUM FINISHED THICKNESS FACE-TO-FACE* (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 hr.</td>
</tr>
</tbody>
</table>

2002 ICC FINAL ACTION AGENDA
15. Exterior or interior walls

<table>
<thead>
<tr>
<th>Proposed Change as Submitted:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Committee Action:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disapproved</td>
</tr>
</tbody>
</table>

Committee Reason: The tested assemblies in Table 719.1(2) of the Supplement reference footnote “q” which reflects a tested assembly at 100% of allowable f<sub>n</sub>. The wall in question was not tested to this loading with the cellulose insulation.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.
This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter's Reason: The purpose of this Public Comment is to request that the voting membership overturn the Committee's recommendation for disapproval and approve the code change as submitted. The reason for this is the Cellulose Insulation Manufacturers Association (CIMA) has responded to the Committee's reason for disapproval and has tested a 1-hour gypsum wallboard assembly using ½" Type X gypsum wallboard with the stud cavities filled with cellulose insulation. This wall assembly has been tested to the full 100% design stress for f'. What this shows is that the 1-hour fire resistance rating is actually achieved with the help of the cellulose insulation so the installation of cellulose insulation in a wall assembly using 5/8" Type X gypsum wallboard should also be acceptable. In other words, the installation of the cellulose insulation in the wall cavities not only does not adversely affect the fire resistance rating, it, in fact, enhances the fire resistance rating.

The fire test was not conducted until after the deadline for submittal of this Public Comment so we can not refer directly to the test report. However, the report will be made available to those individuals interested in reviewing it prior to or at the ICC Annual Joint Conference Code Hearings. We will also provide the test reports to the members of the IBC Fire Safety Code Development Committee for their review prior to the hearings. Thus, if they have any concerns regarding the tests, they can make them known at the hearings. If they agree that the test method was conducted properly and the appropriate stress applied to the studs, then we believe this code change should be disapproved based on that full scale fire test.

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TABLE 719.1 (2) (Supp)
RATED FIRE RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS a,p

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>ITEM NUMBER</th>
<th>CONSTRUCTION</th>
<th>MINIMUM FINISHED THICKNESS FACE-TO-FACE a (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Exterior or interior walls</td>
<td>15 -1.15 a</td>
<td>2&quot; by 4&quot; (51 mm x 152 mm) wood studs at 16 in. centers with double top plates, single bottom plate; interior sides covered with 5/8 in. Type X gypsum wallboard, 4 ft. wide, applied horizontally unblocked, and fastened with 2-1/4 in. Type S drywall screws, spaced 12 in. o.c., wallboard joints covered with paper tape and joint compound, fastener heads not less than 2.6 lb./cu. ft. Rating established for exposure from interior side only.</td>
<td>4 ½</td>
</tr>
</tbody>
</table>

Proponent's Reason: This one-hour fire resistance rated gypsum wallboard wall assembly is included in Table 719.1 (2) as a generic 2 x 4 wood stud gypsum wallboard wall system using 5/8" Type X gypsum wallboard with the stud cavities filled with mineral wool insulation. We are proposing to allow the stud cavities to also be filled with spray-applied cellulose insulation having a minimum nominal density of 2.6 lbs. per cu. ft. as an alternative. A similar wall assembly filled with cellulose insulation also achieved a one-hour fire resistance rating based on a test conducted in accordance with ASTM E 119 by Omega Point Laboratories in a report entitled: ASTM E119—1998 Fire Tests of Building Construction and Materials (Modified) Wood Stud Wall Insulated with Cellulose Insulation Project No. 16094-105449 dated December 21, 1999. This is the same fire test report that was provided to substantiate the use of cellulose insulation for the calculated fire resistance of one-hour walls using ½" thick Type X gypsum wallboard and wood studs in Code Change FS50-00. That code change was approved during the 2000 code change cycle.

The fire test report clearly shows that by filling the stud cavity with cellulose insulation, it is only necessary to use ½" thick Type X gypsum wallboard to achieve the one-hour fire resistance rating. The exterior wall assembly in the table utilizes 5/8" thick Type X gypsum wallboard to achieve the one-hour rating. Thus, the substitution of cellulose insulation is more than adequate to maintain the one hour fire resistance rating of this wall assembly. This substitution is applicable to both load bearing and nonload bearing wall assemblies.

Committee Action: Disapproved

Committee Reason: The tested assemblies in Table 719.1(2) of the Supplement reference footnote “q” which reflects a tested assembly at 100% of allowable fl. The wall in question was not tested to this loading with the cellulose insulation.

Assembly Action: No Motion

Individual Consideration Agenda:

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FS91-02
1405, IRC 613.2

Proposed Change as Submitted:

Proponent: Jim W. Sealy, FAIA, NCARB, Jim Sealy, Architect/Consultant

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. Add new text as follows:

IBC 1405.12.2 Window sills. In dwelling units, as applicable in Section 101.2, where a window is located more than 30 inches (762 mm) above the grade or other surface below, the sill of the window shall be a minimum of 36 inches (914 mm) above the finished floor of the room in which the window is located.
Exceptions:
1. Windows that are not operable.
2. Windows where only the top portion is operable and the bottom edge of the operable portion is a minimum of 36 inches (914 mm) above the floor.
3. Windows which will not open more than 4 inches (102 mm).

2. Add new text as follows:

IRC R613.2 Window sills. In dwelling units, where a window is located more than 30 inches (762 mm) above the grade or other surface below, the sill of the window shall be a minimum of 36 inches (914 mm) above the finished floor of the room in which the window is located.

Exceptions:
1. Windows that are not operable.
2. Windows where only the top portion is operable and the bottom edge of the operable portion is a minimum of 36 inches (914 mm) above the floor.
3. Windows which will not open more than 4 inches (102 mm).

Proponent’s Reason: Because of an ever increasing number of falls from windows in dwelling units, the U.S. Consumer Product Safety Commission, and an ever increasing number of cities and states are promoting and/or requiring the installation of window guards to reduce the number of debilitating and fatal falls from open windows. Logically, and from a common sense standpoint, the problem can be eliminated if the sills of operable windows are required to be a certain minimum height above the floor line. This is truly safety by design, and not an attempt to require safety by devices.

Substantiation:
1. The 30 inch height of a fall which triggers the requirement is based upon the same 30 inch premise as that for requiring guardrails in the existing code.
2. The 36 inch height for a sill is a median height based upon the height of guard rails in R-3 and individual dwelling units of R-2 in the existing code.
3. The 4 inch sphere is from existing code language.

There will be no additional cost impact because of this change.

ITEM 1 (IBC)
Committee Action: Disapproved

Committee Reason: The compromise for the reduced sill height down to 20 inches is too lenient. The window industry should work on this and come back with the proper code language.

Assembly Action: Approved as Submitted-

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jim W. Sealy, FAIA, NCARB, Architect, Consultant, requests Approved as Modified by this comment.

Replace the proposal with the following:

1. IBC 1405.1.2.2 Window Sills. In dwelling units, where the rough opening for the sill portion of an operable window is located more than 72 inches above the ground or other surface below, that portion of the rough opening shall be a minimum of 24 inches above the finished floor of the room in which the window is located.

Exceptions:
1. Windows which will not allow a 4 inch diameter sphere to pass through the opening when the window is in its largest opened position.
2. Windows which are factory equipped with a device that will not allow a 4 inch diameter sphere to pass through the opening when the window is in its largest opened position.

2. IRC R613.2 Window sills. In dwelling units, where the rough opening for the sill portion of an operable window is located more than 72 inches above the ground or other surface below, that portion of the rough opening shall be a minimum of 24 inches above the finished floor of the room in which the window is located.

Exceptions:
1. Windows which will not allow a 4 inch diameter sphere to pass through the opening when the window is in its largest opened position.
2. Windows which are factory equipped with a device that will not allow a 4 inch diameter sphere to pass through the opening when the window is in its largest opened position.

Commenter’s Reason: Of the more than 4,000 children who fall from open windows each year, many of them fall from windows whose sill height is close to the floor. The majority of these children are less than 3 years old, and a reasonably high sill will prevent the accidental falls that occur when the child is in a standing/walking posture. Those are the falls that occur because the sill height is lower than the child’s center of gravity. Raising sill heights to the minimum set by this proposal does not interfere with the emergency egress height and does not interfere with the requirements for ventilation.

FS97-02
1507.2.7 (Supp) & IRC R 905.2.6

Proposed Change as Submitted:
Where the roof slope exceeds 20 units vertical in 12 units horizontal (20:12), special methods of fastening are required. For roofs located where the basic wind speed per Figure R 301.2(4) is 110 mph or greater, special methods of fastening are required. Special fastening methods shall be tested in accordance with ASTM D 3161, modified to use a wind speed of 110 mph.

Shingles classified using ASTM D 3161 are acceptable for use in wind zones including 100 mph. Shingles classified using ASTM D 3161 modified to use a wind speed of 110 mph are acceptable for use in all cases where special fastening is required.

2. Revise as follows:

IRC R905.2.6 Attachment. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer. For normal application, asphalt shingles shall be secured to the roof with not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 20 units vertical in 12 units horizontal (20:12), special methods of fastening are required. For roofs located where the basic wind speed per Figure R 301.2(4) is 110 mph or greater, special methods of fastening are required. Special fastening methods shall be tested in accordance with ASTM D 3161, modified to use a wind speed of 110 mph.

Shingles classified using ASTM D 3161 are acceptable for use in wind zones including 100 mph. Shingles classified using ASTM D 3161 modified to use a wind speed of 110 mph are acceptable for use in all cases where special fastening is required.

Proponent’s Reason: The use of the ASTM D 3161 at 110-mph wind speed evaluation of shingles has been accepted in the State of Florida to evaluate the resistance of shingles to the high winds experienced in hurricane zones. It is a practical test that evaluates the performance of the shingle over 2 hours and will show up weaknesses in the sealant strip. This language specifies where this test is permitted to be used to evaluate shingles.
Shingles classified using ASTM D 3161 are acceptable for use in wind zones including 100 mph less than 110 mph. Shingles classified using ASTM D 3161 modified to use a wind speed of 110 mph are acceptable for use in all cases where special fastening is required.

Analysis: The following combinations of actions would achieve technical inconsistency between the IBC and the IRC:

<table>
<thead>
<tr>
<th>Item 1 AM</th>
<th>Item 2 AM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1 AS</td>
<td>Item 2 AS</td>
</tr>
<tr>
<td>Item 1 D</td>
<td>Item 2 D</td>
</tr>
</tbody>
</table>

**FS99-02**

1507.3.5 (IRC 905.3.5)

**Proposed Change as Submitted:**

**Proponent:** Mark S. Graham, National Roofing Contractors Association (NRCA)

**THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**

1. **Revise as follows:**

**IBC 1507.3.5 Concrete tile.** Concrete roof tiles shall comply with ASTM C 1492, be in accordance with the physical test requirements as follows:

4. **The transverse strength of tiles shall be determined according to Section 5.3 of ASTM C 1167 and in accordance with Table 1507.3.5.**

5. **The absorption of concrete roof tiles shall be determined according to Section 8 of ASTM C 140.** Roof tiles shall absorb not more than 15 percent of the dry weight of tile during the 24-hour immersion test.

6. **Roof tiles shall be tested for freeze/thaw resistance according to Section 8 of ASTM C 67.** Roof tiles shall show no breakage and not have more than 1 percent loss in dry weight of any individual concrete roof tile.

**TABLE 1507.3.5**

<table>
<thead>
<tr>
<th>TILE PROFILE</th>
<th>DRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVERAGE OF FIVE TILES</td>
<td>INDIVIDUAL TILES</td>
</tr>
<tr>
<td>High-profile 400</td>
<td>250</td>
</tr>
<tr>
<td>Medium-profile 300</td>
<td>250</td>
</tr>
<tr>
<td>Flat-profile 300</td>
<td>250</td>
</tr>
</tbody>
</table>

Add the following standard to Chapter 35:

**ASTM C 1492-01 Standard Specification for Concrete Roof Tile**

2. **IRC R905.3.5 Concrete tile.** Concrete roof tile shall comply with ASTM C 1492.

Concrete roof tiles shall be in accordance with the physical test requirements as follows:

4. **The transverse strength of tiles shall be determined according to Section 5.3 of ASTM C 1167 and in accordance with Table 1507.3.5.**

5. **The absorption of concrete roof tiles shall be determined according to Section 8 of ASTM C 140.** Roof tiles shall absorb not more than 15 percent of the dry weight of tile during the 24-hour immersion test.

6. **Roof tiles shall be tested for freeze/thaw resistance according to Section 8 of ASTM C 67.** Roof tiles shall show no breakage and not have more than 1 percent loss in dry weight of any individual concrete roof tile.

**TABLE 1507.3.5**

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</tr>
<tr>
<td>High-profile 400</td>
<td>250</td>
</tr>
<tr>
<td>Medium-profile 300</td>
<td>250</td>
</tr>
<tr>
<td>Flat-profile 300</td>
<td>250</td>
</tr>
</tbody>
</table>

For SI: 1 pound = 4.45 N

Add the following standard to Chapter 43:

**ASTM C 1492-01 Standard Specification for Concrete Roof Tile**

**Proponent's Reason:** This change is intended to clarify the intent of the code and simplify compliance and enforcement. When the IBC was originally drafted, a recognized material standard for concrete roof tile did not yet exist. Prescriptive test requirements were included in IBC 2000 based largely upon a draft ASTM standard for concrete tiles.

Just recently, ASTM has finalized and published a new material standard for concrete roof tile, ASTM C 1492, "Standard Specification for Concrete Roof Tile." This code change proposal deletes the existing prescriptive test methods and incorporate the new ASTM standard.

**Analysis:** This proposal is identical to FS100-02.

The document being proposed is ASTM C1492-01 Standard Specification for Concrete Roof Tile. A review of C1492-01 has demonstrated that the document does not comply with Section 3.6 of the ICC Code Development Process for the International Codes due
to the nonmandatory language in Section 10.1 for rejection of material.

ITEM 1 (IBC)
Committee Action: Disapproved

Committee Reason: The proposed standard, ASTM C 1492, does not comply with Section 3.6 of the ICC Code Development Process for International Codes.

Assembly Action: Approved as Submitted-Motion Failed

ITEM 2 (IRC)
Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Analysis: The following combinations of actions would achieve technical inconsistency between the IBC and the IRC:

Item 1 AS Item 2 AS
or
Item 1 D Item 2 D

FS100-02
1507.3.5 (IRC R905.3.5)

Proposed Change as Submitted:

Proponent: Gary Walker, Walker Engineering, Inc.; representing Roof Tile Institute

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IBC 1507.3.5 Concrete tile. Concrete roof tile shall comply with ASTM C 1492.

Concrete roof tiles shall be in accordance with the physical test requirements as follows:

1. The transverse strength of tiles shall be determined according to Section 5.3 of ASTM C 1167 and in accordance with Table 1507.3.5:

2. The absorption of concrete roof tiles shall be according to Section 6 of ASTM C 140. Roof tiles shall absorb not more than 15 percent of the dry weight of tile during the 24-hour immersion test.

3. Roof tiles shall be tested for freeze/thaw resistance according to Section 8 of ASTM C 67. Roof tiles shall show no breakage and not have more than 1 percent loss in dry weight of any individual concrete roof tile.

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</tr>
<tr>
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<td>400 250</td>
</tr>
<tr>
<td>Medium-profile</td>
<td>300 250</td>
</tr>
<tr>
<td>Flat-profile</td>
<td>300 250</td>
</tr>
</tbody>
</table>

For SI: 1 pound = 4.45 N

Add to Chapter 35:

ASTM C 1492-01 Standard Specification for Concrete Roof Tile R903.5.3

2. IRC R905.3.5 Concrete tile. Concrete roof tile shall comply with ASTM C 1492.

Concrete roof tiles shall be in accordance with the physical test requirements as follows:

4. The transverse strength of tiles shall be determined according to Section 5.3 of ASTM C 1167 and in accordance with Table 1507.3.5:

5. The absorption of concrete roof tiles shall be according to Section 6 of ASTM C 140. Roof tiles shall absorb not more than 15 percent of the dry weight of tile during the 24-hour immersion test.

6. Roof tiles shall be tested for freeze/thaw resistance according to Section 8 of ASTM C 67. Roof tiles shall show no breakage and not have more than 1 percent loss in dry weight of any individual concrete roof tile.

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</tr>
<tr>
<td>Flat-profile</td>
<td>300 250</td>
</tr>
</tbody>
</table>

2002 ICC FINAL ACTION AGENDA 157
Add to Chapter 43:

ASTM
C 1492-01 Standard Specification for Concrete Roof Tile
R903.5.3

Proponent’s Reason: The new ASTM C 1492 covers the physical requirements for concrete roof tiles.

The Transverse Strength requirement in (ASTM C 1492) Section 7.4 under Table 4 (dry) has the identical transverse breaking strength as Table 4.

The Water Absorption requirement in (ASTM C 1492) Section 7.6 under Table 5 for normal weight roof tiles is 12-1/2%, which is lower than the 15% in the IRC. The IRC is not clear on the water absorption requirements for medium weight and lightweight roof tiles. ASTM C 1492 clearly identifies these two roof tiles as having a maximum of 16% and 20% water absorption, respectively. Both ASTM C 1492 and the IRC reference ASTM C 140 for the test procedure.

The Freeze/Thaw Resistance requirements in (ASTM C 1492) Section 7.3 is identical to the IRC pass/fail requirement. Both ASTM C 1492 and the IRC reference ASTM C 140 for the test procedure.

The code requirements for concrete roof tiles are identical under ASTM C 1492 and the IRC. ASTM C 1492 has provided additional requirements for medium weight and lightweight roof tiles. ASTM C 1492 has added requirements for dimensional tolerances and permeability. The test procedures have been clarified for the transverse breaking strength and for the freeze/thaw resistance in ASTM C 1492.

Analysis: This proposal is identical to FS99-02.

The document being proposed is ASTM C1492-01 Standard Specification for Concrete Roof Tile. A review of C1492-01 has demonstrated that the document does not comply with Section 3.6 of the ICC Code Development Process for the International Codes due to the nonmandatory language in Section 10.1 for rejection of material.

ITEM 1 (IBC)
Committee Action: Disapproved
Committee Reason: The proposed standard, ASTM C 1492, does not comply with Section 3.6 of the ICC Code Development Process for International Codes.
Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.
Assembly Action: No Motion

Individual Consideration Agenda:
This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

Public Comment:

Modify parts 1 and 2 of the proposal as follows:
Revise the ASTM reference from ASTM C 1492-01 to ASTM C 1492-02
Commenter’s Reason: The IBC Fire Safety Committee recommended “Disapproval” because ASTM C 1492-01 Standard Specification for Concrete Roof Tiles does not comply with Section 3.6 of the ICC Code Development Process for International Codes. The portion of the ASTM that contains the permissive language is Section 10. Rejection and Rehearing. This section has been revised to remove the permissive language. Section 10 has been replaced with the following revised section. Section 10.1 is from ASTM C 1167-96 Standard Specification for Clay Tiles that is already recognized by the IBC. Section 10.2 is from a proposed revision to ASTM C 1167-96

10. Rejection and Rehearing
10.1 When material that fails to conform to the requirements of this specification is rejected, such rejection shall be promptly reported in writing to the supplier. In case of rejection, when not specifically excluded in the purchase contract, the supplier shall have the right to inspect the rejected lot and resubmit the lot after removal of the material not conforming to the specified requirements, provided this is done within 20 days after receipt of notice of the specific cause of rejection.
10.2 When the shipment fails to conform to the requirements for the grade and type specified, the manufacturer is not prohibited from sorting the lot, and when sorted new specimens shall be selected by the purchaser from the retained lot and tested at the expense of the supplier. When the second set of specimens fails to meet the requirements, the entire lot shall be rejected."

**Analysis:** The following combination of action would achieve technical inconsistency between the IBC and the IRC:

Item 1 AM Item 2 AM
or
Item 1 AS Item 2 AS
or
Item 1 D Item 2 D

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**FS121-02**

**Table 719.1(3)**

**Proposed Change as Submitted:**

**Proponent:** Sam Francis, American Forest & Paper Association

Add new text as follows:

<table>
<thead>
<tr>
<th>FLOOR OR ROOF CONSTRUCTION</th>
<th>ITEM NUMBER</th>
<th>CEILING CONSTRUCTION</th>
<th>MINIMUM THICKNESS OF CEILING (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22.</td>
<td>½ inch deep single leg resilient channel 16 inches o.c. (channels doubled at wallboard end joints), placed perpendicular to the furring strip and joist and attached to each joist by 1 7/8 inch Type S drywall screws, 5/8 inch Type C gypsum wallboard applied perpendicular to the channel with end joints staggered at least four feet and fastened with 1 1/8 Type S drywall screws spaced 7 inches o.c.. Wallboard joints to be taped and covered with joint compound.</td>
<td>4 HR</td>
</tr>
<tr>
<td>22. Wood I-joist (minimum joist depth 9 1/4 inches with a minimum flange depth of 1 5/16 inches and a minimum flange cross sectional area of 2.3 square inches) at 24 in. o.c. spacing with 1 X 4 (nominal) wood furring strip spacer applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2 inch mineral fiber insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joist and supported by the 1 X 4 furring strip spacer.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Proponent’s Reason:** This change brings a generic I-joist assembly into the mainstream of the code.

**Committee Action:** Approved as Submitted

**Committee Reason:** Engineered lumber, including I-joists, are used quite extensively. Inclusion of fire resistance rated designs in the code will assist both the designer and code official.

**Assembly Action:** No Motion

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**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**
Phil Schaeffer, U.S. Gypsum Co., requests Disapproved.

Commenter's Reason: The Code Change Proposal as approved by the Code Committee introduces the wording “5/8 inch Type C” into the code. The proponent’s reason references the fire resistive assembly involved as being a “generic I-joist assembly”. Unlike the term “Type X”, which is used in ASTM C 36 Standard Specification for Gypsum Wallboard and the Gypsum Association’s FIRE RESISTANCE DESIGN MANUAL (GA-600), there is no established industry definition, description or performance criteria for a “Type C” gypsum wallboard nor even any use of the term “Type C” in these publications.

With no established industry definition, description or performance criteria for a “Type C” gypsum wallboard, the proposed fire resistive assembly certainly cannot be considered generic and therefore should not become a part of the code. The following are excerpts with references to Type X gypsum wallboard from ASTM C 36/C 36M – 01 Standard Specification for Gypsum Wallboard and the Gypsum Association’s FIRE RESISTANCE DESIGN MANUAL (GA-600-2000) for your convenience.

Public Comment on FS121-02 Tble 719.1(3) / Excerpts 7/3/02


4. Materials and Manufacture

4.3 Gypsum wallboard, type X (special fire-resistant) designates gypsum wallboard complying with this specification that provides not less than 1 h fire-resistance for boards 5.8 in. [15.9 mm] thick or 3.4 h fire-resistance for boards 1.2 in. [12.7 mm] thick, applied parallel with and on each side of load bearing 2.34 wood studs spaced 16 in. [406 mm] o.c. with 6d coated nails, 1.78 in. [46 mm] long, 0.0915 in. [2.32 mm] diameter shank, 1.4 in. [6.4 mm] diameter heads, spaced 7 in. [178 mm] o.c. with wallboard joints staggered 16 in. [406 mm] on each side of the partition and tested in accordance with the requirements of Test Method E 119.

NOTE 2—Consult producers for independent test data on assembly details and fire resistance classifications for other types of construction. See fire test reports, or listings from recognized fire testing laboratories, for assembly particulars, materials, and classifications.

Gypsum Association FIRE RESISTANCE DESIGN MANUAL (GA-600-2000)

INTRODUCTION (Page IV)

SECTION I USE OF THIS MANUAL AND GENERAL EXPLANATORY NOTES (Pages 1 & 2)

To maintain industry-wide quality assurance standards for gypsum board defined in this Manual as “type X,” the Gypsum Association requires that all companies listing proprietary tests or systems, or relying on the generic systems in this manual, shall subscribe to an on-going third-party, in-plant product inspection and labeling service. Additionally, each member company makes annual written certification to the Gypsum Association that its products manufactured for use in systems listed in this Manual continue to be inspected and labeled by an independent third-party testing service as listed on page 4.

DESCRIPTION OF TERMS USED IN THIS MANUAL

Gypsum Board - defined in ASTM C 11, Standard Terminology

Regular Gypsum Board - a gypsum board with naturally occurring fire resistance from the gypsum in the core;

Type X Gypsum Board - a gypsum board with special core additives to increase the natural fire resistance of regular gypsum board;

Improved Type X Gypsum Board - specially formulated gypsum board, meeting all the requirements of type X gypsum board, with additional properties to further enhance the fire resistive characteristics of the product for use in some proprietary systems; or

Proprietary Type X Gypsum Board - a fire-resistive gypsum board that is manufactured by the companies listed in each proprietary system. These gypsum boards are either type X or improved type X. Consult the manufacturer of the proprietary type X gypsum board in each system to determine which type is required.

FS122-02

1504.1

Proponent: David L. Roodvoets, DLR Consultants; representing ARMA

Revise as follows:

1504.1.1 Wind Resistance of Asphalt shingles. Asphalt shingles shall be designed for wind loads in accordance with Section 1507.2.7.

Proponent’s Reason: This change provides specific information about the wind load design and testing for asphalt shingles that was added to the code in the 2001 changes.

This will not add substantially to the cost of product in these markets.

Analysis: The exception to Section 1504.1 currently requires compliance with Section 1507.2, thus including Section 1507.2.7.

Committee Action: Disapproved

Committee Reason: The proposed text is not necessary as current Section 1504.1 requires compliance with Section 1507.2.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

David Roodvoets, DR Consultants, representing ARMA, requests Approved as Modified by this
Modify proposal as follows:

1504.1.1 Wind Resistance of Asphalt shingles. Asphalt shingles shall be designed for wind speeds in accordance with Section 1507.2.7.

Commenter's Reason: This proposed change is needed to plug a hole in the code and provide appropriate guidance to the users of the code on how to deal with asphalt shingles as it relates to wind resistance.

The committee reason for denial of FS122-02 was based on flawed and incorrect staff analysis. The analysis on FS122-02 in the Proposed Code Changes monograph for the Pittsburgh hearing stated that the “exception to Section 1504.1 currently requires compliance with Section 1507.2, thus including 1507.2.7.” This would be the case only for 2000 edition of the IBC but not if the changes made in the subsequent cycles (2000 and 2001) were considered. The analysis failed to recognize that the 2002 Accumulative Supplement no longer includes an exception at Section 1504.1, and thus a reference back to Section 1507.2.7. As a result of actions on S1-00 (Item 1) and S2-00, the exception to 1504.1 was deleted. The referral from 1504.1 to 1507.2.7 therefore no longer exists. FS122-02 remedies this hole in the code and provides the appropriate link to 1507.2.7.

This change also proposes an editorial modification to ensure consistency in use of terminology. Action on the Building Officials Association of Florida’s proposal RB91-01 created the current language in Section 1507.2.7 (Asphalt Shingles) by specifying tested wind “speeds.” The modification replaces wind loads with wind speeds, which makes it consistent with the language of 1507.2.7.

We believe the language suggested in the change is required to provide a clear guidance for code officials, design professionals and builders as requirement for the use of asphalt shingles and is consistent with the intent of prior committee actions.

Analysis: The commenter is correct with respect to the staff analysis. The exception referring to Section 1507.2 has been deleted in the 2002 Accumulative Supplement.
Proposed Change as Submitted:

Proponent: ICC Board of Directors

1. Revise as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, proper electrical systems and equipment, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment. (ICC EC 101.3)

101.4.1 Electrical. The provisions of the ICC Electrical Code shall apply to the installation of electrical systems, including alterations, repairs, replacement, equipment, appliances, fixtures, fittings and appurtenances thereto, shall comply with Chapter 27.

2. Add new text as follows:

102.7 Maintenance. Electrical systems, equipment, materials and appurtenances, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe, hazard-free condition. Devices or safeguards that are required by this code shall be maintained in compliance with the code edition under which installed. The owner or the owner’s designated agent shall be responsible for the maintenance of the electrical systems and equipment. To determine compliance with this provision, the code official shall have the authority to require that the electrical systems and equipment be reinspected. (ICC EC 102.1.2)

104.12 Engineered design for electrical systems. The design, documentation, inspection, testing and approval of an alternative engineered design electrical system shall comply with this section. (ICC EC 603.1)

104.12.1 Design criteria. An alternative engineered design shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, fire resistance, durability and safety. Materials, equipment or components shall be designed and installed in accordance with the manufacturer’s installation instructions. (ICC EC 603.2)

104.12.2 Submittal. The registered design professional shall indicate on the permit application that the electrical system is an alternative engineered design. The permit and permanent permit records shall indicate that an alternative engineered design was part of the approved installation. (ICC EC 603.3)

104.12.3 Technical data. The registered design professional shall submit sufficient technical data to substantiate the proposed alternative engineered design and to prove that the performance meets the intent of this code. (ICC EC 603.4)

104.12.4 Construction documents. The registered design professional shall submit to the code official two complete sets of signed and sealed construction documents for the alternative engineered design. The construction documents shall include floor plans and a diagram of the work. (ICC EC 603.5)

104.12.5 Design approval. Where the code official determines that the alternative engineered design conforms to the intent of this code, the electrical system shall be approved. If the alternative engineered design is not approved, the code official shall notify the registered design professional in writing, stating the reasons therefore. (ICC EC 603.6)

104.12.6 Inspection and testing. The alternative engineered design shall be tested and inspected in accordance with the requirements of this code. (ICC EC 603.7)

104.13 Coordination of inspections. Wherever in the enforcement of this code or another code or ordinance, the responsibility of more than one code official of the jurisdiction is involved, it shall be the duty of the code officials involved to coordinate their inspections and administrative orders as fully as practicable so that the owners and occupants of the structure shall not be subjected to visits by numerous inspectors or multiple or conflicting orders. Wherever an inspector from any agency or department observes an apparent or actual violation of some provision of some law, ordinance or code not within the inspector’s authority to enforce, the inspector shall report the findings to the code official having jurisdiction. (ICC EC 702.7)

3. Revise as follows:

105.2 (Supp) Work exempt from permit. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following: (ICC EC 401.3)
Electrical:

The following work shall be exempt from the requirement for a permit:

1. Listed cord and plug connected temporary decorative lighting.
2. Reinstallation of attachment plug receptacles, but not the outlets therefor.
3. Repair or replacement of branch circuit overcurrent devices of the required capacity in the same location.
4. Temporary wiring for experimental purposes in suitable experimental laboratories.
5. Electrical wiring, devices, appliances, apparatus or equipment operating at less than 25 volts and not capable of supplying more than 50 watts of energy.
6. Repair and maintenance: Minor repair work, including the replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles.

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

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

4. Add new text as follows:

105.2 Inspection required. Before a permit is issued, the code official is authorized to inspect and approve the systems, equipment, buildings, devices, premises, and spaces or areas to be used. (ICC EC 402.4)

5. Revise as follows:

105.2.2 Repairs. Application or notice to the building official is not required for ordinary repairs to structures, replacement of lamps, or the connection of approved portable electrical equipment to approved permanently installed receptacles, reinstallation of attachment plug receptacles or repair or replacement of branch circuit overcurrent devices of the required capacity in the same location such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required means of egress, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include addition to, alteration of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety. (ICC EC 401.3)

6. Add new text as follows:

105.8 Contractors' responsibilities. It shall be the responsibility of every contractor who enters into contracts for the installation or repair of electrical systems for which a permit is required to comply with adopted state and local rules and regulations concerning licensing. (ICC EC 702.9)

106.1.1.2 Penetrations. Construction documents shall indicate where penetrations will be made for mechanical, plumbing and electrical systems and shall indicate the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking. (ICC EC 501.2.1)

7. Revise as follows:

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

107.3 Temporary power. The building official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the ICC Electrical Code Chapter 27.

8. Add new text as follows:

109.3.1 Underground. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping and conductors installed, and before backfill is put in place. Where excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the raceway, cable or conductors, or where corrosive action will occur, protection shall be provided in the form of granular or selected material, approved running boards, sleeves or other means. (ICC EC 702.1.3)

109.3.5 Rough-in. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all wiring and other components to be concealed are complete, and prior to the installation of wall
109.7 Evaluation and follow-up inspection services. Prior to the approval of a prefabricated construction assembly having concealed mechanical, plumbing or electrical work and the issuance of a permit, the code official shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the code official to determine conformance to this code. (ICC EC 702.1.1.1)

109.7.1 Evaluation service. The code official shall designate the evaluation service of an approved agency as the evaluation agency, and review such agency’s evaluation report for adequacy and conformance to this code. (ICC EC 702.1.1.1)

109.7.2 Follow-up inspection. Except where ready access is provided to systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct the in–plant inspections as frequently as necessary to ensure conformance to the approved evaluation report or shall designate an independent, approved inspection agency to conduct such inspections. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request, and the electrical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed. (ICC EC 702.1.1.2)

109.7.3 Test and inspection records. Required test and inspection records shall be available to the code official at all times during the fabrication of the system and the erection of the building; or such records as the code official designates shall be filed. (ICC EC 702.1.1.3)

111.4 Connection after order to disconnect. A person shall not make utility service or energy source connections to systems regulated by this code, which have been disconnected or ordered to be disconnected by the code official, or the use of which has been ordered to be discontinued by the code official until the code official authorizes the reconnection and use of such systems. (ICC EC 801.3.1)

113.5 Service. Any order or notice issued pursuant to this code shall be served upon the owner, operator, occupant or other person responsible for the condition or violation, either by personal service, mail or by delivering the same to, and leaving it with, some person of responsibility upon the premises. For unattended or abandoned locations, a copy of such order or notice shall be posted on the premises in a conspicuous place at or near the entrance to such premises, and the order or notice shall be mailed by certified mail with return receipt requested or a certificate of mailing, to the last known address of the owner, occupant or both. (ICC EC 1002.3)

113.6 Compliance with orders and notices. Orders and notices issued or served as provided by this code shall be complied with by the owner, operator, occupant or other person responsible for the condition or violation to which the order or notice pertains. (ICC EC 1002.4)

113.7 Failure to comply. Failure to comply with an abatement notice or other corrective notice issued by the code official shall result in each day that such violation continues being regarded as a new and separate offense. (ICC EC 1002.6)

113.8 Unauthorized tampering. Signs, tags or seals posted or affixed by the code official shall not be mutilated, destroyed or tampered with or removed without authorization from the code official. (ICC EC 1002.7)

113.9 Abatement of violation. The imposition of the penalties herein described shall not prevent the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; or to prevent illegal occupancy of a structure or premises; or to stop an illegal act, conduct of business or occupancy of a structure on or about any premises. (ICC EC 1003.2)

115.5 Unsafe electrical systems. An electrical system that is unsafe, constitutes a fire or health hazard, or is otherwise dangerous to human life, as regulated by this code, is hereby declared as an unsafe electrical system. Use of an electrical system regulated by this code constituting a hazard to health, safety or welfare by reason of inadequate maintenance, dilapidation, fire hazard, disaster, damage or abandonment is hereby declared an unsafe use. Such unsafe equipment and appliances are hereby declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal. (ICC EC 901.1)

115.5.1 Authority to condemn electrical systems. Wherever the code official determines that any electrical system, or portion thereof, regulated by this code has become hazardous to life, health or property, the code official shall order in writing that such electrical system either be removed or restored to a safe condition. A time limit for compliance with such order shall be specified in the written notice. A person shall not use or maintain a defective electrical system or equipment after receiving such notice.

Where such electrical system is to be disconnected, written notice as prescribed in this code shall be given. In
cases of immediate danger to life or property, such disconnection shall be made immediately without such notice. (ICC EC 901.2)

9. Revise as follows:

904.3.1 Electrical wiring. Electrical wiring shall be in accordance with the ICC Electrical Code Chapter 27.

907.5 Wiring. Wiring shall comply with the requirements of the ICC Electrical Code Chapter 27 and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

909.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be from the normal building power systems. Secondary power shall be from an approved standby source complying with the ICC Electrical Code Chapter 27. The standby power source and its transfer switches shall be in a separate room from the normal power transformers and switch gear and shall be enclosed in a room of not less than 1-hour fire-resistance-rated construction ventilated directly to and from the exterior. Power distribution from the two sources shall be by independent routes. Transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power. The systems shall comply with the ICC Electrical Code Chapter 27.

909.12.1 Wiring. In addition to meeting requirements of the ICC Electrical Code Chapter 27, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.

[F] 909.16.3 Control action and priorities. The fire-fighter’s control panel actions shall be as follows:

1. ON-OFF, OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the fire-fighter’s control panel, no automatic or manual control from any other control point within the building shall contradict the control action. Where automatic means are provided to interrupt normal, nonemergency equipment operation or produce a specific result to safeguard the building or equipment (i.e., duct freezestats, duct smoke detectors, high-temperature cutouts, temperature-actuated linkage and similar devices), such means shall be capable of being overridden by the fire-fighter’s control panel. The last control action as indicated by each fire-fighter’s control panel switch position shall prevail. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

Exception: Power disconnects required by the ICC Electrical Code Chapter 27.

2. Only the AUTO position of each three-position fire-fighter’s control panel switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the NORMAL, nonemergency, building control position. Where a fire-fighter’s control panel is in the AUTO position, the actual status of the device (on, off, open, closed) shall continue to be indicated by the status indicator described above. When directed by an automatic signal to assume an emergency condition, the NORMAL position shall become the emergency condition for that device or group of devices within the zone. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

1204.4.1 Controls. The control for activation of the required stairway lighting shall be in accordance with the ICC Electrical Code Chapter 27.

1405.10.4 Grounding. Grounding of metal veneers on buildings shall comply with the requirements of the ICC Electrical Code Chapter 27.


10. Delete and substitute as follows:

SECTION 2701
GENERAL

2701.1 Scope. This chapter governs the electrical components equipment and systems used in buildings and structures covered by this code. Electrical components, equipment and systems shall be designed and constructed in accordance with the provisions of the ICC Electrical Code:

2701.1 Scope. This chapter governs the design and construction of electrical systems and equipment. (ICC EC 1201.1)

11. Add new text as follows:

2701.2 Abatement of electrical hazards. All identified electrical hazards shall be abated. All identified hazardous
electrical conditions in permanent wiring shall be brought to the attention of the code official responsible for enforcement of this code. Electrical wiring, devices, appliances and other equipment which is modified or damaged and constitutes an electrical shock or fire hazard shall not be used. (ICC EC 1201.2)

2702.1 General. The provisions of this section shall apply to the design, construction, installation, alteration, repairs, relocation, replacement, addition to, use and maintenance of electrical systems and equipment. (ICC EC 1201.1)

2702.2 Codes. Electrical systems and equipment shall be designed and constructed in accordance with the International Residential Code or NFPA 70 as applicable, except as otherwise provided in this code. (ICC EC 1201.1.1 Supp)

2702.3 Nonmetallic-sheathed cable. The use of Type NM, NMC and NMS (nonmetallic sheathed) cable wiring methods shall not be limited based on height, number of stories or construction type of the building or structure. (ICC EC 1202.2 Supp)

2702.4 Penetrations. Penetrations of walls, floors, ceilings and assemblies required to have a fire-resistance rating, shall be protected in accordance with this code. Where cables, conductors and raceways penetrate fireblocking or draftstopping, such penetrations shall be protected by filling the annular space with an approved fireblocking material. (ICC EC 1202.2)

2702.5 Cutting, notching and boring. The cutting, notching and boring of wood and steel framing members, structural members and engineered wood products shall be in accordance with this code. (ICC EC 1202.3 Supp)

2702.6 Smoke detector circuits. Smoke detectors required by this code and installed within dwelling units shall not be connected as the only load on a branch circuit. Such detectors shall be supplied by branch circuits having lighting loads consisting of lighting outlets in habitable spaces. (ICC EC 1202.3)

2702.7 Appliance access. Where appliances requiring access are installed in attics or underfloor spaces, a lighting fixture controlled by a switch located at the required passageway opening to such space and a receptacle outlet shall be provided at or near the appliance location. (ICC EC 1202.4)

2702.8 Prohibited grounding electrode. Fuel gas piping shall not be used as a grounding electrode. (ICC EC 1202.5)

2702.9 Wiring in plenums. Combustible electrical or electronic wiring methods and materials, optical fiber cable, and optical fiber raceway exposed within plenums regulated by Section 602 of the International Mechanical Code shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread not greater than 5 feet (1524 mm) when tested in accordance with UL 910. Only type OFNP (plenum-rated nonconductive optical fiber cable) shall be installed in plenum-rated optical fiber raceways. Wiring, cable and raceways addressed in this section shall be listed and labeled as plenum rated and shall be installed in accordance with this code. (ICC EC 1202.8)

2702.9.1 Combustible electrical equipment. Combustible electrical equipment exposed within plenums regulated by Section 602 of the International Mechanical Code shall have a peak rate of heat release not greater than 100 kilowatts (kW), a peak optical density not greater than 0.50, and an average optical density not greater than 0.15 when tested in accordance with UL 2043. Combustible electrical equipment shall be listed and labeled. (ICC EC 1202.8.1)

2702.10 Engine and gas turbine-powered equipment and appliances. Permanently installed equipment and appliances powered by internal combustion engines and turbines shall be installed in accordance with the manufacturer’s installation instructions, the International Mechanical Code, International Fuel Gas Code and NFPA 37. (ICC EC 1202.9)

2702.11 Stationary fuel cell power plants. Stationary fuel cell power plants having a power output not exceeding 1,000 kW shall be tested in accordance with ANSI Z21.83 and shall be installed in accordance with the manufacturer’s installation instructions. (ICC EC 1202.10)

2702.12 Boiler control requirements. The power supply to the electrical control system for boilers shall be from a two-wire branch circuit that has a grounded conductor or from an isolation transformer with a two-wire secondary. Where an isolation transformer is provided, one conductor of the secondary winding shall be grounded. Control voltage shall not exceed 150 volts nominal, line to line. Control and limit devices shall interrupt the ungrounded side of the circuit. A means of manually disconnecting the control circuit shall be provided, and controls shall be arranged so that when deenergized, the burner shall be inoperative. Such disconnecting means shall be capable of being locked in the off position and shall be provided.
with ready access. (ICC EC 1202.11)

2702.13 Equipment and door labeling. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar approved wording. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident. (ICC EC 1202.12)

12. Revise as follows:

SECTION 2703
EMERGENCY AND STANDBY POWER SYSTEMS

2703.1 Installation. Emergency and standby power systems required by this code or the IFC shall be installed in accordance with the IFC, ICC Electrical Code, NFPA 110 and, NFPA 111 and this code. (ICC EC 1202.6).

2703.2 Where required. Emergency and standby power systems shall be provided where required by Sections 2702.2.1 through 2702.2.19.

2703.2.1 Group A occupancies. Emergency power shall be provided for voice communication systems in Group A occupancies in accordance with Section 907.2.1.2.

2703.2.2 Smoke control systems. Standby power shall be provided for smoke control systems in accordance with Section 909.11.

2703.2.3 Exit signs. Emergency power shall be provided for exit signs in accordance with Section 1003.2.10.5.

2703.2.4 Means of egress illumination. Emergency power shall be provided for means of egress illumination in accordance with Section 1003.2.11.2

2703.2.5 Accessible means of egress elevators. Standby power shall be provided for elevators that are part of an accessible means of egress in accordance with Section 1003.2.13.3.

2703.2.6 Horizontal sliding doors. Standby power shall be provided for horizontal sliding doors in accordance with Section 1003.3.1.3.3.

2703.2.7 Semiconductor fabrication facilities. Emergency power shall be provided for semiconductor fabrication facilities in accordance with Section 415.9.10

2703.2.8 Membrane structures. Standby power shall be provided for auxiliary inflation systems in accordance with Section 3102.8.2. Emergency power shall be provided for exit signs in temporary tents and membrane structures in accordance with the International Fire Code.

2703.2.9 Hazardous materials. Emergency or standby power shall be provided in occupancies with hazardous materials in accordance with Section 414.5.4.

2703.2.10 Highly toxic and toxic materials. Emergency power shall be provided for occupancies with highly toxic or toxic materials in accordance with the International Fire Code.

2703.2.11 Organic peroxides. Standby power shall be provided for occupancies with organic peroxides in accordance with the International Fire Code.

2703.2.12 Pyrophoric materials. Emergency power shall be provided for occupancies with pyrophoric materials in accordance with the International Fire Code.

2703.2.13 (Supp) Covered mall buildings. Standby power shall be provided for voice/alarm communication systems in covered mall buildings in accordance with Section 402.12.

2703.2.14 (Supp) High rise buildings. Emergency and standby power shall be provided in high rise buildings in accordance with Sections 403.10 and 403.11.

2703.2.15 Underground buildings. Emergency and standby power shall be provided in underground buildings in accordance with Sections 405.9 and 405.10.

2703.2.16 Group I-3 occupancies. Emergency power shall be provided for doors in Group I-3 occupancies in accordance with Section 408.4.2.

2703.2.17 Airport traffic control towers. Standby power shall be provided in airport traffic control towers in accordance with Section 412.1.5.

2703.2.18 Elevators. Standby power for elevators shall be provided as set forth in Section 3003.1.

2703.2.19 Smoke proof enclosures. Standby power shall be provided for smoke proof enclosures as required by Section 909.20.

2703.3 Maintenance. Emergency and standby power systems shall be maintained and tested in accordance with the International Fire Code.

13. Add new text as follows:

SECTION 2704
TESTING
2704.1 General. Electrical work shall be tested as required in this code. Tests shall be performed by the permit holder and observed by the code official. (ICC EC 703.1)

2704.2 Apparatus, material and labor for tests. Apparatus, material and labor required for testing an electrical system or part thereof shall be furnished by the permit holder. (ICC EC 703.2)

2704.3 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the code official for inspection and testing. (ICC EC 703.3)

SECTION 2705
EXISTING ELECTRICAL FACILITIES

2705.1 Existing buildings. This section shall apply to buildings and structures that are within the scope of the International Property Maintenance Code. Every occupied building shall be provided with an electrical system in compliance with the requirements of Sections 1203.1.1 through 1203.1.5. (ICC EC 1203.1)

2705.1.1 Service. The size and usage of appliances and equipment shall serve as a basis for determining the need for additional facilities in accordance with this code. Dwelling units shall be served by a three-wire, 120/240 volt, single-phase electrical service having a rating of not less than 60 amperes. (ICC EC 1203.1.1)

2705.1.2 Electrical system hazards. Where it is found that the electrical system in a structure constitutes a hazard to the occupants or the structure by reason of inadequate service, improper fusing, insufficient receptacle and lighting outlets, improper wiring or installation, deterioration or damage, or for similar reasons, the code official shall require the defects to be corrected to eliminate the hazard. (ICC EC 1203.1.2)

2705.1.3 Installation. All electrical equipment, wiring and appliances shall be properly installed and maintained in a safe and approved manner. (ICC EC 1203.1.3)

2705.1.4 Receptacles. Every habitable space in a dwelling shall be provided with at least two separate and remote receptacle outlets. Every laundry area shall be provided with at least one grounding-type receptacle outlet or a receptacle outlet with ground fault circuit interrupter protection. Every bathroom shall contain at least one receptacle outlet. Any new bathroom receptacle outlet shall have ground fault circuit interrupter protection. (ICC EC 1203.1.4)

2705.1.5 Lighting fixtures. Every public hall, interior stairway, toilet room, kitchen, bathroom, laundry room, boiler room and furnace room shall be provided with at least one electric lighting fixture. (ICC EC 1203.1.5)

2705.2 Load calculations. Where an addition or alteration is made to an existing electrical system, an electrical load calculation shall be prepared to determine if the existing electrical service has the capacity to serve the added load. (ICC EC 501.2.2)

SECTION 2706
MAINTENANCE

2706.1 General. Electrical systems, equipment, materials and appurtenances, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe, hazard-free condition. Devices or safeguards that are required by this code shall be maintained in compliance with the code edition under which installed. The owner of the owner’s designated agent shall be responsible for the maintenance of the electrical systems and equipment. To determine compliance with the provision, the code official shall have the authority to require that the electrical systems and equipment be reinspected. (ICC EC 102.1.2)

Proponent’s Reason: The sole intent of this proposal is to reformat the IBC to include the provisions currently in the 2000 ICC Electrical Code. The format of the proposal follows the section/chapter numbering in the IBC, preceded by an instruction line as to the scope of the change (i.e., revision/deletion/addition). It is not the intent of this proposal to provide the forum to debate the technical merits of any provision within the current ICC Electrical Code. Debate on technical merits of provisions will occur in the discussions of Code Changes EL 1-02 and EL 3 through EL 8-02. It is also not the intent to act on this proposal in part, but rather, to act on it as a single indivisible proposal.

Much of the current ICC Electrical Code text originated from other ICC codes which deal with equipment and systems (i.e., the IMC, IFGC, IPC, and IPC). As such, this text was not necessary in the 2000 IBC and this reformatting does not effect any codes other than the IBC. Text that is unique to the ICC Electrical Code is relocated to the International Building Code by this proposal as the IBC would cover equipment and systems not previously within the scope of the IBC. The applicable section of the ICC Electrical Code is identified in bold (ICC EC Section number) following the IBC section proposed for revision/addition.

This proposal does not provide for the relocation of any ICC Electrical Code text that was already in the International Building Code as this would result in a duplication of text.

ICCElectrical code Sections 102.6, 102.8, 302.2 and 702.1.7 are not proposed to be relocated into the IBC because the history of development of the IBC provides evidence that such administrative text was either rejected or removed from the IBC during its development process.

ICCElectrical code Sections 702.4.2 and 702.8 are not proposed to be relocated into the IBC because such administrative text is not found in any other ICC code and would cause the IBC chapter one to be inconsistent with the chapter one of all other ICC codes.

The ICC Board of Directors will consider the future of the ICC Electrical Code based on the action on this proposal.

Committee Action: Disapproved

Committee Reason: The ICC EC text should exist in a distinct code to simplify application, location and modification of such text. The electrical provisions should remain segregated to facilitate adoption and local amendments. Relocation of the text will have a broad and uncertain impact on the provisions of the IBC.
Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

ICC Board of Directors, requests Approved as Modified by this comment.

Modify proposal as follows:

1. No change to proposed text.

101.3 Intent. The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, proper electrical systems and equipment, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment. (ICC EC 101.3)

104.12.1 Design criteria. An alternative engineered design shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, fire resistance, durability and safety. Materials, equipment or components shall be designed and installed in accordance with the manufacturer's installation instructions. (ICC EC 603.4)

104.12.2 Submittal. The registered design professional shall indicate on the permit application that the electrical system is an alternative engineered design. The permit and permanent permit records shall indicate that an alternative engineered design was part of the approved installation. (ICC EC 603.3)

104.12.3 Technical data. The registered design professional shall submit sufficient technical data to substantiate the proposed alternative engineered design and to prove that the performance meets the intent of this code. (ICC EC 603.4)

104.12.4 Construction documents. The registered design professional shall submit to the code official two complete sets of signed and sealed construction documents for the alternative engineered design. The construction documents shall include floor plans and a diagram of the work. (ICC EC 603.5)

104.12.5 Design approval. Where the code official determines that the alternative engineered design conforms to the intent of this code, the electrical system shall be approved. If the alternative engineered design is not approved, the code official shall notify the registered design professional in writing, stating the reasons therefore. (ICC EC 603.6)

104.12.6 Inspection and testing. The alternative engineered design shall be tested and inspected in accordance with the requirements of this code. (ICC EC 603.7)

104.13 Coordination of inspections. Wherever in the enforcement of this code or another code or ordinance, the responsibility of more than one code official of the jurisdiction is involved, it shall be the duty of the code officials involved to coordinate their inspections and administrative orders as fully as practicable so that the owners and occupants of the structure shall not be subjected to visits by numerous inspectors or multiple or conflicting orders. Wherever an inspector from any agency or department observes an apparent or actual violation of some provision of some law, ordinance or code not within the inspector's authority to enforce, the inspector shall report the findings to the code official having jurisdiction. (ICC EC 702.7)

3. Delete proposed text as follows:

105.2 (Supp) Work exempt from permit. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following: (ICC EC 401.3)

(No change to Building, Mechanical or Plumbing parts)

Electrical:

The following work shall be exempt from the requirement for a permit:

3. Listed cord and plug connected temporary decorative lighting.
4. Reinstallation of attachment plug receptacles, but not the outlets therefor.
5. Repair or replacement of branch circuit overcurrent devices of the required capacity in the same location.
6. Temporary wiring for experimental purposes in suitable experimental laboratories.
7. Electrical wiring, devices, apparatus or equipment operating at less than 25 volts and not capable of supplying more than 50 watts of energy.
8. Minor repair work, including the replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles.

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

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

4. No change to proposed text.

105.2 Inspection required. Before a permit is issued, the code official is authorized to inspect and approve the systems, equipment, buildings, devices, premises, and spaces or areas to be used. (ICC EC 402.4)

5. No change to proposed text.

105.2.2 Repairs. Application or notice to the building official is not required for ordinary repairs to structures, replacement of lamps, or the connection of approved portable electrical equipment to approved permanently installed receptacles, reinstallation of attachment plug
receptacles or repair or replacement of branch circuit overcurrent devices of the required capacity in the same location. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required means of egress, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include addition to, alteration of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety. (ICC EC 401.3)

6. Delete proposed text as follows:

405.8 Contractors’ responsibilities. It shall be the responsibility of every contractor who enters into contracts for the installation or repair of electrical systems for which a permit is required to comply with adopted state and local rules and regulations concerning licensing. (ICC EC 702.9)

106.1.1.2 Penetrations. Construction documents shall indicate where penetrations will be made for mechanical, plumbing and electrical systems and shall indicate the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking. (ICC EC 501.2.1)

7. No change to proposed text.

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

107.3 Temporary power. The building official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in Chapter 27.

8. Delete proposed text as follows:

409.3.3 Underground. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping and conductors installed, and before backfill is put in place. Where excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the roadway, cable or conductors, or where corrosive action will occur, protection shall be provided in the form of granular or selected material, approved running boards, sleeves or other means. (ICC EC 702.1.1.3)

409.3.5 Rough-in. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all wiring and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes. (ICC EC 702.1.4)

409.7 Evaluation and follow-up inspection services. Prior to the approval of a prefabricated construction assembly having concealed mechanical, plumbing or electrical work and the issuance of a permit, the code official shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the code official to determine conformance to this code. (ICC EC 702.1.4)

409.7.1 Evaluation service. The code official shall designate the evaluation service of an approved agency as the evaluation agency, and review such agency’s evaluation report for adequacy and conformance to this code. (ICC EC 702.1.4.1)

409.7.2 Follow-up inspection. Except where ready access is provided to systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct the plant inspections as frequently as necessary to ensure conformance to the approved evaluation report or shall designate an independent, approved inspection agency to conduct such inspections. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request, and the electrical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed. (ICC EC 702.1.4.2)

109.7.3 Test and inspection records. Required test and inspection records shall be available to the code official at all times during the fabrication of the system and the erection of the building; or such records as the code official designates shall be filed. (ICC EC 702.1.4.3)

111.4 Connection after order to disconnect. A person shall not make utility service or energy source connections to systems regulated by this code, which have been disconnected or ordered to be disconnected by the code official, or the use of which has been ordered to be discontinued by the code official until the code official authorizes the reconnection and use of such systems. (ICC EC 801.3.1)

113.5 Service. Any order or notice issued pursuant to this code shall be served upon the owner, operator, occupant or other person responsible for the condition or violation, either by personal service, mail or by delivering the same to, and leaving it with, some person of responsibility upon the premises. For unattended or abandoned locations, a copy of such order or notice shall be posted on the premises in a conspicuous place at or near the entrance to such premises, and the order or notice shall be mailed by certified mail with return receipt requested or a certificate of mailing, to the last known address of the owner, occupant or both. (ICC EC 1002.3)

113.6 Compliance with orders and notices. Orders and notices issued or served as provided by this code shall be complied with by the owner, operator, occupant or other person responsible for the condition or violation to which the order or notice pertains. (ICC EC 1002.4)

113.7 Failure to comply. Failure to comply with an abatement notice or other corrective notice issued by the code official shall result in each day that such violation continues being regarded as a new and separate offense. (ICC EC 1002.6)

113.8 Unauthorized tampering. Signs, tags or seals posted or affixed by the code official shall not be mutilated, destroyed or tampered with or removed without authorization from the code official. (ICC EC 1002.7)

113.9 Abatement of violation. The imposition of the penalties herein described shall not prevent the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; or to prevent illegal occupancy of a structure or premises; or to stop an illegal act, conduct of business or occupancy of a structure on or about any premises. (ICC EC 1003.2)

114.5 Unsafe electrical systems. An electrical system that is unsafe, constitutes a fire or health hazard, or is otherwise dangerous to human life, as regulated by this code, is hereby declared as an unsafe electrical system. Use of an electrical system regulated by this code constituting a fire or health hazard, or is otherwise dangerous to human life is hereby declared an unsafe use. Such unsafe equipment and appliances are hereby declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal. (ICC EC 901.4)

114.5.1 Authority to condemn electrical systems. Wherever the code official determines that any electrical system, or portion thereof, regulated by this code has become hazardous to life, health or property, the code official shall order in writing that such electrical system either be removed or restored to a safe condition. A time limit for compliance with such order shall be specified in the written notice. A person shall not use or maintain a defective electrical system or equipment after receiving such notice.

Where such electrical system is to be disconnected, written notice as prescribed in this code shall be given. In cases of immediate danger to
life or property, such disconnection shall be made immediately without such notice. (ICC EC 901.2)

9. No change to proposed text.

904.3.1 Electrical wiring. Electrical wiring shall be in accordance with Chapter 27.

907.5 Wiring. Wiring shall comply with the requirements of Chapter 27 and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

909.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved standby source complying with Chapter 27. The standby power source and its transfer switches shall be in a separate room from the normal power transformers and switch gear and shall be enclosed in a room of not less than 1-hour fire-resistance-rated construction ventilated directly to and from the exterior. Power distribution from the two sources shall be by independent routes. Transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power. The systems shall comply with Chapter 27.

909.12.1 Wiring. In addition to meeting requirements of Chapter 27, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways.

[F] 909.16.3 Control action and priorities. The fire-fighter’s control panel actions shall be as follows:

1. ON-OFF, OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the fire-fighter’s control panel, no automatic or manual control from any other control point within the building shall contradict the control action. Where automatic means are provided to interrupt normal, nonemergency equipment operation or produce a specific result to safeguard the building or equipment (i.e., duct freeezestats, duct smoke detectors, high-temperature cutouts, temperature-actuated linkage and similar devices), such means shall be capable of being overridden by the fire-fighter’s control panel. The last control action as indicated by each fire-fighter’s control panel switch control panel switch position shall prevail. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

Exception: Power disconnects required by Chapter 27.

2. Only the AUTO position of each three-position fire-fighter’s control panel switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the NORMAL, nonemergency, building control position. Where a fire-fighter’s control panel is in the AUTO position, the actual status of the device (on, off, open, closed) shall continue to be indicated by the status indicator described above. When directed by an automatic signal to assume an emergency condition, the NORMAL position shall become the emergency condition for that device or group of devices within the zone. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

1204.4.1 Controls. The control for activation of the required stairway lighting shall be in accordance with Chapter 27.

1405.10.4 Grounding. Grounding of metal veneers on buildings shall comply with the requirements of Chapter 27.

3401.3 Compliance with other codes. Alterations, repairs, additions and changes of occupancy to existing structures shall comply with the provisions for alterations what is, repairs, additions and changes of occupancy in the International Fire Code, International Fuel Gas Code, International Plumbing Code, International Property Maintenance Code.


10. No change to proposed text.

SECTION 2701
GENERAL

2701.1 Scope. This chapter governs the design and construction of electrical systems and equipment. (ICC EC 1201.1)

11. Delete proposed text as follows:

2701.2 Abatement of electrical hazards. All identified electrical hazards shall be abated. All identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the code official responsible for enforcement of this code. Electrical wiring, devices, appliances and other equipment which is modified or damaged and constitutes an electrical shock or fire hazard shall not be used. (ICC EC 1201.2)

2701.3 Appliance and fixture listing. Electrical appliances and fixtures shall be tested and listed in published reports of inspected electrical equipment by an approved agency and installed in accordance with all instructions included as part of such listing. (ICC EC 1201.3)

SECTION 2702
PROVISIONS

2702.1 General. The provisions of this section shall apply to the design, construction, installation, alteration, repairs, relocation, replacement, addition to, use and maintenance of electrical systems and equipment. (ICC EC 1201.1)

2702.2 Codes. Electrical systems and equipment shall be designed and constructed in accordance with the International Residential Code or NFPA 70 as applicable, except as otherwise provided in this code. (ICC EC 1201.1.1 Supp)

2702.3 Nonmetallic-sheathed cable. The use of Type NM, NMC and NMS (nonmetallic sheathed) cable wiring methods shall not be limited based on height, number of stories or construction type of the building or structure. (ICC EC 1202.2 Supp)

2702.4 Penetrations. Penetrations of walls, floors, ceilings and assemblies required to have a fire-resistance rating, shall be protected in accordance with this code. Where cables, conductors and raceways penetrate fireblocking or draftstopping, such penetrations shall be protected by filling the annular space with an approved fireblocking material. (ICC EC 1202.2)

2702.6 Smoke detector circuits. Smoke detectors required by this code and installed within dwelling units shall not be connected as the only load on a branch circuit. Such detectors shall be supplied by branch circuits having lighting loads consisting of lighting outlets in habitable spaces. (ICC EC 1202.3)

2702.7 Appliance access. Where appliances requiring access are installed in attics or underfloor spaces, a lighting fixture controlled by a switch located at the required passageway opening to such space and a receptacle outlet shall be provided at or near the appliance location. (ICC EC 1202.4)

2702.8 Prohibited grounding electrode. Fuel gas piping shall not be used as a grounding electrode. (ICC EC 1202.5)

2702.9 Wiring in plenums. Combustible electrical or electronic wiring
methods and materials, optical fiber cable, and optical fiber raceway exposed within plenums regulated by Section 602 of the International Mechanical Code shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread not greater than 5 feet (1524 mm) when tested in accordance with UL 910. Only type OFNP (plenum-rated nonconductive optical fiber cable) shall be installed in plenum-rated optical fiber raceways. Wiring, cable and raceways addressed in this section shall be listed and labeled as plenum rated and shall be installed in accordance with this code. (ICC EC 1202.8)

2702.9.1 Combustible electrical equipment. Combustible electrical equipment exposed within plenums regulated by Section 602 of the International Mechanical Code shall have a peak rate of heat release not greater than 100 kilowatts (kW), a peak optical density not greater than 0.50, and an average optical density not greater than 0.15 when tested in accordance with UL 2043. Combustible electrical equipment shall be listed and labeled. (ICC EC 1202.8.1)

2702.10 Engine and gas turbine-powered equipment and appliances. Permanently installed equipment and appliances powered by internal combustion engines and turbines shall be installed in accordance with the manufacturer’s installation instructions, the International Mechanical Code, International Fuel Gas Code and NFPA 37 (ICC EC 1202.9)

2702.11 Stationary fuel cell power plants. Stationary fuel cell power plants having a power output not exceeding 1,000 kW shall be tested in accordance with ANSI Z21.63 and shall be installed in accordance with the manufacturer’s installation instructions. (ICC EC 1202.10)

2702.12 Boiler control requirements. The power supply to the electrical control system for boilers shall be from a two-wire branch circuit that has a grounded conductor or from an isolation transformer with a two-wire secondary. Where an isolation transformer is provided, one conductor of the secondary winding shall be grounded. Control voltage shall not exceed 150 volts nominal, line to line. Control and limit devices shall interrupt the ungrounded side of the circuit. A means of manually disconnecting the control circuit shall be provided, and controls shall be arranged so that when deenergized, the burner shall be inoperative. Such disconnecting means shall be capable of being locked in the off position and shall be provided with ready access. (ICC EC 1202.11)

2702.13 Equipment and door labeling. Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar approved wording. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident. (ICC EC 1202.12)

12. No change to proposed text:

SECTION 2703
EMERGENCY AND STANDBY POWER SYSTEMS

2703.1 Installation. Emergency and standby power systems required by this code or the IFC shall be installed in accordance with the IFC, NFPA 110, NFPA 111 and this code. (ICC EC 1202.6)

2703.2 Where required. Emergency and standby power systems shall be provided where required by Sections 2702.2.1 through 2702.2.19.

2703.2.1 Group A occupancies. Emergency power shall be provided for voice communication systems in Group A occupancies in accordance with Section 907.2.1.2.

2703.2.2 Smoke control systems. Standby power shall be provided for smoke control systems in accordance with Section 909.11.

2703.2.3 Exit signs. Emergency power shall be provided for exit signs in accordance with Section 1003.2.10.5.

2703.2.4 Means of egress illumination. Emergency power shall be provided for means of egress illumination in accordance with Section 1003.2.11.2

2703.2.5 Accessible means of egress elevators. Standby power shall be provided for elevators that are part of an accessible means of egress in accordance with Section 1003.2.13.3.

2703.2.6 Horizontal sliding doors. Standby power shall be provided for horizontal sliding doors in accordance with Section 1003.3.1.3.3.

2703.2.7 Semiconductor fabrication facilities. Emergency power shall be provided for semiconductor fabrication facilities in accordance with Section 415.9.10

2703.2.8 Membrane structures. Standby power shall be provided for auxiliary inflation systems in accordance with Section 3102.8.2. Emergency power shall be provided for exit signs in temporary tents and membrane structures in accordance with the International Fire Code.

2703.2.9 Hazardous materials. Emergency or standby power shall be provided in occupancies with hazardous materials in accordance with Section 414.5.4.

2703.2.10 Highly toxic and toxic materials. Emergency power shall be provided for occupancies with highly toxic or toxic materials in accordance with the International Fire Code.

2703.2.11 Organic peroxides. Standby power shall be provided for occupancies with organic peroxides in accordance with the International Fire Code.

2703.2.12 Pyrophoric materials. Emergency power shall be provided for occupancies with pyrophoric materials in accordance with the International Fire Code.

2703.2.13 (Supp) Covered mall buildings. Standby power shall be provided for voice/alarm communication systems in covered mall buildings in accordance with Section 402.12.

2703.2.14 (Supp) High rise buildings. Emergency and standby power shall be provided in high rise buildings in accordance with Sections 403.10 and 403.11.

2703.2.15 Underground buildings. Emergency and standby power shall be provided in underground buildings in accordance with Sections 405.9 and 405.10.

2703.2.16 Group I-3 occupancies. Emergency power shall be provided for doors in Group I-3 occupancies in accordance with Section 408.4.2.

2703.2.17 Airport traffic control towers. Standby power shall be provided in airport traffic control towers in accordance with Section 412.1.5.

2703.2.18 Elevators. Standby power for elevators shall be provided as set forth in Section 3003.1.

2703.2.19 Smoke proof enclosures. Standby power shall be provided for smoke proof enclosures as required by Section 909.20.

2703.3 Maintenance. Emergency and standby power systems shall be maintained and tested in accordance with the International Fire Code.

13. No change to proposed text:

SECTION 2704
TESTING

2704.1 General. Electrical work shall be tested as required in this code. Tests shall be performed by the permit holder and observed by the code official. (ICC EC 703.1)
2002 ICC FINAL ACTION AGENDA

EL3-02

101.3

Proposed Change as Submitted:

Proponent: IIEC John Terry; representing The Drafting Committee

1. Revise as follows:

101.3 Scope. This code shall regulate the design, construction, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of electrical systems and equipment. The alteration, repair, relocation, addition to and replacement of electrical systems and equipment shall also comply with the International Existing Building Code.

102.1.3 Additions, alterations and repairs. Additions, alterations, renovations and repairs to electrical systems and equipment shall conform to that required for new electrical systems and equipment without requiring that the existing electrical systems or equipment comply with all of the requirements of this code. Additions, alterations and repairs shall not cause existing electrical systems or equipment to become unsafe, hazardous or overloaded.

Minor additions, alterations, renovations and repairs to existing electrical systems and equipment shall meet the provisions for new construction, except where such work is performed in the same manner and arrangement as was in the existing system, is not hazardous and is approved.

Additions, alterations, renovations and repairs to electrical systems shall comply with the provisions of the International Existing Building Code and this code, as
Chapter 13

102.1.4 Change in occupancy. It shall be unlawful to make a change in the occupancy of any structure that will subject the structure to any special provision of this code applicable to the new occupancy without approval. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new occupancy and that such change of occupancy does not result in any hazard to public health, safety or welfare. The provisions of the International Existing Building Code shall apply to all buildings undergoing a change of occupancy.


303.1 Use and occupancy. No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until a certificate of occupancy classification of a building or structure or portion thereof shall be made until a certificate of occupancy has been provided in accordance with the International Building Code and as provided in the International Existing Building Code for change of occupancy.

303.2 Change in use. Changes in the character or use of an existing structure shall not be made except as specified in the International Existing Building Code.

901.7 Restoration. The system or equipment determined to be unsafe by the code official is permitted to be restored to a safe condition. To the extent that repairs, alterations or additions are made or a change of occupancy occurs during the restoration of the structure, such repairs, alterations, additions or change of occupancy shall comply with the requirements of this code and the International Existing Building Code.

1202.1 General. The provisions of this section shall apply to the design, construction, installation, alteration, repairs, relocation, replacement, addition to, use and maintenance of electrical systems and equipment. The alteration, repair, relocation, addition to and replacement of electrical systems and equipment shall also comply with the International Existing Building Code. Where differences occur between provisions of this code and referenced codes or standards, the provisions of this code shall apply.

Include IEBC-2003 as a referenced document under ICC.

Proponent's Reason: The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.

The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001. The proposed code change submitted here is a part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

1. 101.3-The reference to repair, alteration, etc. in the first sentence remains because there are still certain sections dealing with these subject present in the ICC Electrical Code. These sections remain in the ICC Electrical Code for professionals ease of access to such information. The last sentence related to existing buildings undergoing repairs, alterations, etc. and the reference to the IEBC is needed to refer the code user to electrical requirements that might be triggered as a result of work performed under the jurisdiction of the IEBC.

2. 102.1.3-The IEBC addresses electrical issues related to additions, alterations and repairs. The IEBC Drafting Committee after extensive discussions agreed on the goal that existing building provisions while providing for health and safety should also encourage the use and reuse of existing buildings. Accordingly Sections 401.2, 401.3, 408 (Repair), 501.2, 503.3 (Alteration level 1), 601.2, 608 (Alteration level 2), 701.2 (Alteration level 3), and 901.1 (Additions) address such issues.

3. 102.1.4-This section is revised to make reference to the IEBC. The IEBC contains comprehensive provisions for change of occupancy.

4. 201.3-The International Existing Building Code is added as many terms related to existing buildings such as those discussed under 102.1.3 are found in the IEBC.

Committee Action: Disapproved

Committee Reason: The IEBC development is incomplete and deferring coverage to the IEBC is premature.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

John Terry, State of New Jersey, requests Approved as Modified by this comment.

Modify proposal as follows:

101.3 Scope. This code shall regulate the design, construction, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of electrical systems and equipment. The alteration, repair, relocation, addition to and replacement of electrical systems and equipment shall also comply with the International Existing Building Code.

102.1.3 Additions, alterations and repairs. Additions, alterations, renovations and repairs to electrical systems shall comply with the provisions of the International Existing Building Code and this code, as applicable.

102.1.4 Change in occupancy. The provisions of the International Existing Building Code shall apply to all buildings undergoing a change of occupancy.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the International Building Code, International Energy Conservation Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code,
Existing buildings. The responsibility of drafting a code to have comprehensive provisions for established the IEBC Drafting Committee and charged it with the 2003 family of International Codes. The ICC Board of Directors the ICC Code Development Process. The 2003 IEBC will be part of the committee developed a draft(s) which was then exposed to the rigors of process was very similar to the process used to develop the IBC - a 34, Existing Structures, with a reference to the IEBC. The IEBC Drafting maintenance of provisions in the 2002 Cycle, just like all the I-codes. In

303.2 Change in use. Changes in the character or use of an existing structure shall not be made except as specified in the International Existing Building Code.

901.7 Restoration. The system or equipment determined to be unsafe by the code official is permitted to be restored to a safe condition. To the extent that repairs, alterations or additions are made or a change of occupancy occurs during the restoration of the structure, such repairs, alterations, additions or change of occupancy shall comply with the requirements of this code and the International Existing Building Code.

1202.1 General. The provisions of this section shall apply to the design, construction, installation, alteration, repairs, relocation, replacement, addition to, use and maintenance of electrical systems and equipment. The alteration, repair, relocation, addition to and replacement of electrical systems and equipment shall also comply with the International Existing Building Code. Where differences occur between provisions of this code and referenced codes or standards, the provisions of this code shall apply.

Chapter 13
Include IEBC-2003 as a referenced document under ICC.

1.  Revise as follows:

1201.1.1 (Supp) Adoption. Electrical systems and equipment shall be designed and constructed in accordance with the International Residential Code or NFPA 70 as applicable, except as otherwise provided in this code.

2.  Delete without substitution:

1202.2 (Supp) Nonmetallic sheathed cable. The use of Type NM, NMC and NMS (nonmetallic sheathed) cable wiring methods shall not be limited based on height, number of stories or construction type of the building or structure.

Propponent’s Reason: The ICC Electrical Code was changed in the 2001 code cycle to prohibit any limitations on NM cable based on height, number of stories or construction type. The result is the allowance for basically unlimited use of this combustible wiring method in any type building of any height. We are confused about the Committee Reason for its acceptance of the two proposals (EL-2 and EL-3) that resulted in this change: for another electrical code proposal (EL-5) on arc-fault circuit interruption, the Committee ruled that this was an issue for the NEC, but for the proposals concerning wiring methods, which are also electrical products, the Committee removed the limitations of the NEC.

The proponents of the proposals focused on the elevation sensitivity issue with NM cable, in other words, “the cable doesn’t know what floor it’s on.” Just as other products are regulated by floor or building type, consideration should certainly be give to the type of wiring method used as the building increases in height and egress becomes more difficult. This cable is a combustible cable that is only required to meet the UL Vertical Flame test, the least severe flame test, i.e. 1700 BTU for 60 seconds; 70,000 BTU for 20 minutes on metal-jacketed cable. It has a smoke developed index of 915, more than twice that allowed for Class A interior finish materials.

Committee Action: Disapproved

Committee Reason: There is no technical support to demonstrate that Type NM cable is a problem for the allowed usage. It is appropriate to regulate building height and construction materials in the ICC codes just as it is appropriate to regulate technical matters such as arc-fault circuit interrupters in NFPA 70. Engineers specify conduit in construction because of the flexibility it affords, not because cables are less safe. The ICC membership has spoken its will on this issue with no need to revisit it repeatedly.

Assembly Action: No Motion

Individual Consideration Agenda
This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Peggy Sams, Steel Tube Institute requests Approved as Submitted.

Commenter's Reason: The Committee Reason for disapproving this proposal states: “There is no technical support to demonstrate that Type NM cable is a problem for the allowed usage.” We have previously submitted considerable documentation concerning this issue, including
The NEC rules for the use of NM cable are derived from public proposals and are evaluated by technical committees whose membership represent a broad spectrum of technical expertise from the electrical industry. Aside from the raw cable construction and performance information provided here, the technical committees address the practical and field related nuances affecting the design, installation, use, and inspection of NM cable. The NEC Technical committee with the support of the NFPA membership, the Technical Correlating Committee and Standards council have concluded that the current construction of Type NM cable is not suitable for use in any building, of any height, of any construction, and for practically any use or occupancy. The ICC Electrical Codes should not permit such a dramatic departure from the established expertise in this matter.

Committee Action: Disapproved

Committee Reason: There is no technical support to demonstrate that Type NM cable is a problem for the allowed usage. It is appropriate to regulate building height and construction materials in the ICC codes just as it is appropriate to regulate technical matters such as arc-fault circuit interrupters in NFPA 70. Engineers specify conduit in construction because of the flexibility it affords, not because cables are less safe. The ICC membership has spoken its will on this issue with no need to revisit it repeatedly.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

George A. Straniero, AFC Cable requests Approved as Submitted.

Commenter's Reason: Reconsider the proposal on its merits. The committee’s reasons for disapproval were that:

1. There is no technical support to demonstrate that NM cable is a unique wiring method.

Proposition: George A. Straniero, AFC Cable Systems

Delete without substitution:

1202.2 (Supp) Nonmetallic-sheathed cable. The use of Type NM, NMC and NMS (nonmetallic-sheathed) cable wiring methods shall not be limited based on height, number-of-stories or construction type of the building or structure.

Propponent’s Reason: Type NM cable is a unique wiring method. It is the only power wiring method permitted in buildings without being contained either in conduit or within a metallic sheath. Additionally, NM cable is also the documented lowest performing power wiring method that is permitted in buildings. Permission is the ICC Electrical Code for the cable to be used in any building, of any height, of any construction, and for practically any use or occupancy is questionable at best and at worst removes all caution and safety.

Acceptance of this proposal will return the requirements for Type NM cable back to the NEC. The NEC requirements for NM may be considered too conservative by some but the current provision of the ICC EC simply ignores the multitude of conditions and hazards that will be encountered from the unlimited use of this minimal wiring method without any controls on where it will be used.

The NEC process is not perfect. Few processes are. However, the process is moving forward towards the final refinement of the proper combination of cable construction, performance and installation parameters that will maintain an effective level of “practical safeguarding of persons and property from hazards arising from the use of electricity”, that is the stated purpose of the NEC (Section 90.1).

A summary of the performance and construction differences for NM and the next level of permitted wiring method (MC cable) is being provided to show the extent to which the level of safety is being affected in hi-rise construction.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type NM</th>
<th>Type MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer covering (mechanical protection for conductors)</td>
<td>0.020” PVC/0.010” Paper</td>
<td>0.012 - 0.025” Steel or Aluminum</td>
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<td>Tensile strength of outer covering</td>
<td>PVC - 1500 psi Paper - none</td>
<td>Steel - 40,000 psi Aluminum - 38,000 psi</td>
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<td>Fire Performance</td>
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<td></td>
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<tr>
<td>No. of cables in flame test</td>
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<tr>
<td>Length of cable</td>
<td>18 inches</td>
<td>8 ft.</td>
</tr>
<tr>
<td>Burner size</td>
<td>3/8 inch diameter</td>
<td>13-7/16 inch</td>
</tr>
<tr>
<td>Heat rate of flame</td>
<td>1,700 BTU/hr.</td>
<td>70,000 BTU/hr.</td>
</tr>
<tr>
<td>Time of flame exposure</td>
<td>1 minute - 15 seconds</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Limited smoke rating</td>
<td>None</td>
<td>*Rated “LS” for Limited Smoke</td>
</tr>
</tbody>
</table>

*0.95m² total smoke release and 0.25m³/s peak smoke release
problem for the allowed usage.

Response:
The technical data supplied with the proposal clearly shows that NM cable can be more readily damaged, more readily ignites and more readily propagates fire and smoke. The allowed usage by the ICC Electrical Code for the cable to be used in any building, of any height, of any construction, and for any use or occupancy is not realistic in the expectation that NM cable will not be a problem. The allowed usage is questionable at best and at worst removes all caution and safety.

2. It is appropriate to regulate building height and construction materials in the ICC Codes just as it is appropriate to regulate technical matters such as arc-fault circuit interrupters in NFPA 70.

Response:
The appropriateness of the ICC to regulate building height and constructions was not challenged by the proposal. The issue at hand is a technical matter concerning an electrical wiring method and it is appropriate that it be regulated by NFPA 70 the same as for arc-fault circuit interrupters.

The NEC rules for the use of NM cable are derived from public proposals and are evaluated by technical committees whose membership represent a broad spectrum of technical expertise from the electrical industry. Aside from the raw cable construction and performance information, the technical committees address the practical and field related nuances affecting the design, installation, use, and inspection of NM cable. It is appropriate that it be regulated by NFPA 70.

3. Engineers specify conduit in construction because of the flexibility it affords, not because cables are less safe.

Response:
Engineers specify conduit and metal covered cables for both safety and flexibility. Conduit and metal covered cables resist damage both during and after installation, they resist ignition, flame spread and smoke generation and are therefore a safer wiring method.

4. The ICC membership has spoken its will on this issue with no need to revisit it.

Response:
The committee does a disservice to the membership by suggesting that the free flow of ideas and debate be limited especially where the safety of persons and property is being compromised for the sake of building cost savings.

EL7-02
1202.2

Proposed Change as Submitted:

Proponent: Phil Simmons, National Armored Cable Manufacturers Associations

Delete without substitution:

4202.2 (Supp) Nonmetallic-sheathed cable. The use of Type NM, NMC and NMS (nonmetallic-sheathed) cable wiring methods shall not be limited based on height, number of stories or construction type of the building or structure.

Proponent’s Reason: This proposal seeks to reverse the action taken during the ICC code revision process during the year 2001 for the following reasons:

1. The fact that manufacturers of the Type NM cable do not support its use above three stories is perhaps the most significant reason for accepting this Proposal and reversing the action of adopting Proposal EL4-01 during 2001. Increasing the use of Type NM cable beyond that permitted in the National Electrical Code (NEC) should not be supported. Proposals and Comments to increase the number of stories permitted for Type NM cable were made during the processing of the 2002 NEC. During that nearly two-year process, not a single manufacturer of Type NM cable supported expanding its use as accepted in the ICC Electrical Code.

2. Proposals of a technical nature should not be permitted in the ICC Electrical Code. According to the title and foreword of the document, the ICC Electrical Code is intended to be of an administrative and not of a technical nature. A review of previously accepted sections to Chapter 12 of the ICC Electrical Code indicates the requirements do not amend the NEC. It contains requirements that are in addition to the NEC. Several Committee members at the Portland, Oregon hearings stated the ICC Electrical Code should not amend the NEC. They urged the Committee to reject the Proposal. Obviously, the Committee did not support their views.

While making piecemeal technical changes to the National Electrical Code in the ICC process can certainly be done as was demonstrated the last two years, the Committee and each voting member should seriously consider whether this action is appropriate. We feel it is not. The appropriate installation of Type NM cables is a technical and a safety issue, not an administrative one. Such changes should be considered on a technical and factual basis and not for any other reason.

3. The change accepted by the Committee and the ICC voting members to allow Type NM, NMC and NMS in buildings through four stories was not adequately substantiated in the Proposal accepted by the Committee in 2000. No documentation was submitted to prove that Type NM cable is equal to other wiring methods permitted or required by the NEC for such buildings. As can be seen in item 5 of this Proposal, Type NM cable does not come close to Type AC or MC cables in protection of the contained conductors. Such documentation should be required or the expansion of the use of Type NM cables should not be permitted in the ICC Electrical Code.

4. The reference in Proposal EC 4-01 to acceptance of expanded use of Type NM cables in Michigan and Massachusetts does not begin to tell the whole story. The fact that use of a particular wiring method is permitted cannot assume that wiring method is actually used. So, for fire statistics to be meaningful, data on the numbers of high-rise buildings that were wired with Type NM cables in these states should be compared to other states where Type NM cable was not allowed by a Code that was enforced by electrical inspection agencies. In addition, it should be recognized that local jurisdictions in Michigan were permitted to amend the state electrical code and some did. In Massachusetts, Type NM cable is not permitted to extend beyond the floor of origin.

5. Buildings of greater height often have additional construction features required by the Building Codes due to concerns for the life-safety of occupants such as for providing safe exiting for people in the building. The use of Type NM wiring products in these buildings as the Section now allows, will reduce the level of safety required by the NEC. The proponents of Proposal EL4-01 did not submit any substantiation that Type NM cable is equal in construction to the safer wiring methods required by the NEC for high-rise construction.

6. Type NM wiring methods cannot be considered as safe as Type AC or Type MC cable products to which they are compared. Type NM cable is not required to meet the same fire-resistance or construction
Type NM is unique when compared to other Code-recognized wiring methods. Type NM readily ignites and propagates flame. Metallic wiring methods do not. The fire performance difference between Type NM and armored cables is dramatic. Type NM cable must only meet the UL Vertical Flame test. This is the least severe flame test of any cable that is listed by UL. The test involves a single 18-inch length of NM cable that is subjected to a 5-inch flame from a 3/8-inch diameter Bunsen-type burner. The heat from the flame is 1,700 BTU/hr. The flame is applied to the cable for 15 seconds on and 15 seconds off five times for a total exposure to the flame of 1 minute and 15 seconds. The cable can flame for 60 seconds after the test flame is removed.

Type CMX communications cable is a power-limited communications cable that is closest to NM cable (a power cable) in fire characteristics. Even CMX cable must meet the UL Vertical Wire flame test. CMX must also either (1) be installed in raceway, (2) be installed in non-concealed spaces and be no longer than 10 ft. long, (3) be less than 0.25 in. in diameter where installed in one- and two-family dwellings, or (4) be less than 0.25 in. and installed only in non-concealed spaces of multifamily dwellings.

If the proponents of the expanded use of Type NM cables believe these additional safety features are valid for the NEC, why weren't they included in the proposals for the ICC Electrical Code? (At this writing, the expanded use of Type NM cable in the NEC has been appealed in the NFPA process and the result of the appeal is not known.)

Type NM cable products are not as safe from physical damage as armored cable products are. Observed damage to this cable during or after the installation includes:

1. Staples are often driven too tightly or at an angle to the cable. This can easily damage the outer jacket and expose the insulated conductors.
2. Overdriven staples can cause a high-resistance fault which has been the origination of fires. In some cases, the fire from this abuse will occur months or years later due to temperature cycling of the conductors.
3. Other trades on the job site can easily and unintentionally damage Type NM cables with pipes, ductwork, structural members or tools.
4. Other trades have been observed using Type NM cable that pass through bored holes in studs for a ladder to reach above the framing. This abuse can damage the jacket or conductors where it passes through bored holes, where it is stapled or where it enters boxes.
5. Type NM cables, having a nonmetallic overall jacket, are much more susceptible to damage from nails and screws during building construction and during later remodeling projects. As a journeyman electrician, I have personally had to repair damage to Type NM cables from these incidents.

Type NM cable products cannot compete with armored cable products when it comes to protection from physical damage or suitability for high-rise construction.

9. If this Section of the ICC Electrical Code continues as a part of that Code, it will cause confusion for electrical installers and inspectors. Some communities may accept the revisions to the ICC Electrical Code while others may not. Electrical contractors want the uniform...
application of electrical requirements contained in the National Electrical Code.

Committee Action: Disapproved

Committee Reason: There is no technical support to demonstrate that Type NM cable is a problem for the allowed usage. It is appropriate to regulate building height and construction materials in the ICC codes just as it is appropriate to regulate technical matters such as arc-fault circuit interrupters in NFPA 70. Engineers specify conduit in construction because of the flexibility it affords, not because cables are less safe. The ICC membership has spoken its will on this issue with no need to revisit it repeatedly.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Phil Simmons, National Armored Cable Manufacturers Association requests Approved as Submitted.

Commenter's Reason: Reconsider the proposal on its merits and approve it as submitted.

With all due respect, the Committee's published reasons for disapproving the proposal is not responsive to the documentation provided with the proposal. The documentation proves conclusively that Type NM cable is not even close to Type AC or Type MC cables in providing a safe and secure wiring method for higher-rise structures.

The committee’s reasons for disapproval were that:

1. There is no technical support to demonstrate that NM cable is a problem for the allowed usage.

   Response: The technical data supplied with the proposal clearly shows that NM cable can be more readily damaged, more readily ignites and more readily propagates fire and smoke. The allowed usage by the ICC Electrical Code for the cable to be used in any building, of any height, of any construction, and for any use or occupancy is not realistic in the expectation that NM cable will not be a problem. The expanded usage allowed in the ICC Electrical Code is questionable at best and at worst removes all caution and safety.

2. It is appropriate to regulate building height and construction materials in the ICC Codes just as it is appropriate to regulate technical matters such as arc-fault circuit interrupters in NFPA 70.

   Response: This Committee response is mixing apples and oranges! This proposal or comment has never questioned the appropriateness of the ICC codes to regulate the types of construction for various heights of buildings. We agree that construction requirements should become more restrictive as the building increases in height. It is however, inappropriate for the Committee to modify installation requirements of the National Electrical Code in a piecemeal manner in the ICC Electrical Code.

   The NEC rules for the use of NM cable are derived from public proposals and comments and are evaluated by technical committees whose membership represent a broad spectrum of technical expertise from the electrical industry. Most, if not all, proposals and comments present a history of problems with the installation of Type NM cable. The NEC, like other codes, tends to be reactive to historical problems.

It is appropriate that NFPA 70 regulate the installation of Type NM cable.

3. Engineers specify conduit in construction because of the flexibility it affords, not because cables are less safe.

   Response: The Committee provides no documentation to support this statement. Engineers specify conduit and metal covered cables for a variety of reasons including both safety and flexibility along with installed cost. Conduit and metal covered cables resist damage both during and after installation, they resist ignition, flame spread and smoke generation and are therefore a safer wiring method than Type NM cable.

4. The ICC membership has spoken its will on this issue with no need to revisit it.

   Response: This response smacks of “Our minds are made up, please don’t confuse us with the facts!” Sadly, it seems the motivation for accepting the unlimited use of Type NM cable was based on a backlash against NFPA over the building code rather than on the appropriate limitations on Type NM cable.
G2-02
101.3

Proposed Change as Submitted:

Proponent: Gregory G. Victor, Glendale Fire Department, AZ

Revise as follows:

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

Proponent’s Reason: This proposal clarifies that code officials are concerned about the safety of fire fighters and other emergency responders and that many provisions of this code are intended to apply to fire fighters safety during emergency operations.

Committee Action: Approved as Modified

Modify proposal as follows:

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

Committee Reason: Based on the proponent’s published reason except that the modification is needed to delete text which has the potential to cause inconsistent enforcement by being overly broad in nature. This proposed code change, as modified, essentially codifies current practice. This proposal does not impose or require any additional requirements beyond the parameters in the code. The current provisions in the body of the code are consistent and supportive of the objective as proposed to the intent section.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Sam Francis, American Forest & Paper Association, requests Disapproved.

Fatalities in Selected Fields, 1980-1989

G4-02
105.2

Proposed Change as Submitted:

Proponent: Edmund C. Domian, C.B.O., West Valley City, Utah

Revise as follows:

105.2 (Supp) Work exempt from permit. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

Building:
1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 200 (18.58 m²) square feet and the structure is not classified as a Group H occupancy.

2. through 13. (No change to current text)

(No change to remainder of section text)

THIS PROPOSAL ACHIEVES TECHNICAL CONSISTENCY BETWEEN THE IBC AND IRC. THE FOLLOWING TEXT OF THE IRC IS SHOWN FOR INFORMATION PURPOSES ONLY.

R105.2 (Supp) Work exempt from permit. Permits shall not be required for the following. Exemption from the permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction.

Building:
1. One-story detached accessory structures, provided the floor area does not exceed 200 (18.58 m²) square feet.

Proponent’s Reason: To make this exception uniform with the reasoning of the IRC. Also playhouses are not commercial in nature so their inclusion in this exception is inappropriate. The remaining text of this exception must be modified to insure no business can circumvent the codes by storing non-exempt amounts of flammable or hazardous materials in detached storage sheds without the necessary precautions required by code.

Committee Action: Disapproved

Committee Reason: This proposed code change, if approved, would create overly restrictive regulation of accessory buildings. Substantiation for the deletion of playhouses and the increase to 200 square feet has not been provided. An almost identical code change (G29-99) was previously considered and disapproved for essentially the same reasons.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Edmund C. Domian, West Valley City, UT, requests Approved as Modified by this comment.

Modify proposal as follows:

105.2 (Supp) Work exempt from permit. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

Building:
1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 200 (18.58 m²) square feet and the structure is not classified as a Group H hazardous occupancy.

2. through 13. (No change to current text)

(No change to remainder of section text)

Commenter’s Reason: Without this clause any business can store unlimited amount and types of flammable, combustible, and hazardous materials in a detached storage shed on property without safeguards normally required due to property lines, adjacent occupancies, employee and public safety, etc.

Public Comment 2:

Gilbert Gonzales, Murray City Corp., representing Utah Chapter of ICC, requests Approved as Modified by this comment.

Modify proposal as follows:

105.2 (Supp) Work exempt from permit. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

Building:
1. One-story detached accessory structures accessory to Group R occupancies used as tool and storage sheds, playhouses and similar uses, provided the floor area does
not exceed 200 (18.6 m²) square feet and the structure is not classified as a Group H hazardous occupancy.

2. through 13. (No change to current text)

(No change to remainder of section text)

**Commenter’s Reason:** Changing the area to 200 sq.ft (18.6 m²) and requiring the structure to be accessory to a group R occupancy is consistent with the IRC.

### G5-02

106.2

**Proposed Change as Submitted:**

**Proponent:** James A. Rossberg, P.E., American Society of Civil Engineers; representing Federal Emergency Management Agency

Revise as follows:

106.2 Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades, and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

**Committee Action:** Approved as Submitted

**Committee Reason:** Based on the proponent’s published reason and to provide flood hazard terminology that is consistent with the IRC and federal regulations.

### G7-02

109.3.3

**Proposed Change as Submitted:**

**Proponent:** James A. Rossberg, P.E., American Society of Civil Engineers; representing Federal Emergency Management Agency

Revise as follows:

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

**Committee Reason:** The IBC should remain just that, The International Building Code. As more and more users of other documents attempt to insert other requirements from their specific field the Building Code becomes more unwieldy for the user than it is intended. As stated in IBC 104: The building official is hereby authorized and directed to enforce the provisions of this code. By inserting requirements other than what is minimally necessary to issue a building permit you are burdening the building official with one more item that he/she is going to have to require with the submittal documents before a permit can be issued. Municipal building departments are already struggling with staffing levels and in our region of the country there are attempts to legislate the timeliness for permit issuance from the application date and by adding more non-building related requirements this adds even more strain to the local building official’s position. The proponent’s proposal may have merit, but keep it where it belongs, along with who has to administrate it.

**Public Comment:**

Cliff Skogstad, City of St. Michael, MN, representing Minnesota Building Officials, requests Disapproved.

**Commenter’s Reason:** The International Building Code includes provisions intended to result in resistance to flood loads and flood damage. Sec. 1612.3 establishes flood hazard areas by reference to maps prepared by the Federal Emergency Management Agency or other flood maps in jurisdictions that adopt and designate more extensive flood hazard areas or flood hazard areas based on more restrictive criteria. All such maps and information are readily available to the public. In order to determine whether the provisions related to flood hazard areas apply, this code change requires the applicant to show on the site plan the information related to those areas, if present on the site.

**Committee Action:** Approved as Submitted

**Committee Reason:** The International Building Code includes provisions intended to result in resistance to flood loads and flood damage. Sec. 1612.3 establishes flood hazard areas by reference to maps prepared by the Federal Emergency Management Agency or other flood maps in jurisdictions that adopt and designate more extensive flood hazard areas or flood hazard areas based on more restrictive criteria. All such maps and information are readily available to the public. In order to determine whether the provisions related to flood hazard areas apply, this code change requires the applicant to show on the site plan the information related to those areas, if present on the site.

**Committee Action:** Approved as Submitted

**Committee Reason:** Based on the proponent’s published reason and to provide flood hazard terminology that is consistent with the IRC and federal regulations.

**Assembly Action:** No Motion

**Individual Consideration Agenda:**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Cliff Skogstad, City of St. Michael, MN, representing Minnesota Building Officials, requests Disapproved.
CONSISTENCY BETWEEN THE IBC AND IRC. THE FOLLOWING IRC TEXT IS SHOWN FOR INFORMATION PURPOSES ONLY.

R109.1.3 Floodplain inspections. For construction permitted in areas prone to flooding as established by Table R301.2(1), upon placement of the lowest floor, including basement, and prior to further vertical construction, the building official shall require submission of a certification, prepared by a registered professional engineer or land surveyor, of the elevation of the lowest floor, including basement, required in Section R327.

Proponent’s Reason: Sec. 109.3 of the code specifies when other required inspections are to be conducted. This code change, which is consistent with the International Residential Code at Sec. R109.1.3, clarifies the optimal time to document the elevation of a structure’s lowest floor. For most buildings in flood hazard areas, raising the lowest floor to or above the design flood elevation is the most significant factor in minimizing flood damage. Therefore, it is important that the code official determine compliance when the floor is placed, rather than upon completion of construction.

Committee Action: Approved as Submitted

Committee Reason: Based on the proponent’s published reason and to provide flood hazard regulation that is consistent with the IRC.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Cliff Skogstad, City of St. Michael, MN, representing Minnesota Building Officials, requests Disapproved.

Commenter’s Reason: The IBC should remain just that, The International Building Code. As more and more users of other documents attempt to insert other requirements from their specific field the Building Code becomes more unwieldy for the user than it is intended. As stated in IBC 104: The building official is hereby authorized and directed to enforce the provisions of this code. By inserting requirements other than what is minimally necessary to issue a building permit you are burdening the building official with one more item that he/she is going to have to require with the submittal documents before a permit can be issued. Municipal building departments are already struggling with staffing levels and in our region of the country there are attempts to legislate the timeliness for permit issuance from the application date and by adding more non-building related requirements this adds even more strain to the local building official’s position. The proponent’s proposal may have merit, but keep it where it belongs, along with who has to administrate it.

R201.4; IZC 201.4; IEBC (Final Draft) 201.4;

Proposed Change as Submitted:

Proponent: Robert D. Lee, Town of Cave Creek, AZ; representing Arizona Building Officials (AZBO)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL, IECC, IFGC, IMC, IPC, IPMC, IPSDC, IRC BUILDING/ENERGY, IZC AND IEBC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. Revise as follows:

IBC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

2. Revise as follows:

ICC-EC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

3. Revise as follows:

IECC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

4. Revise as follows:

IFGC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

5. Revise as follows:

IMC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.
6. Revise as follows:

IPC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

7. Revise as follows:

IPMC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

8. Revise as follows:

IPSDC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

9. Revise as follows:

IRC R201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

10. Revise as follows:

IZC 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

11. Revise as follows:

IEBC (Final Draft) 201.4 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. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinary accepted meanings.

Proponent’s Reason: This revised text was approved by the ICC Fire Code Development Committee at the Portland code hearings (Code Change F7-01) for inclusion in the IFC and there should be consistency in all the codes.

Analysis: The ICC Codes Correlation Committee (CCC) reviewed this proposal and determined that the membership should decide the extent of correlation that should exist among the International Codes on this issue through the code development process.

ITEM 1 (IBC)
Committee Action: Disapproved
Committee Reason: The dictionary being proposed is not the only one available and there has been no justification submitted as to why it should be the one referenced. Dictionaries are not developed in accordance with ICC referenced standards procedures. This action is consistent with that taken on G9-02, Item 2 and by the other code development committees.

Assembly Action: No Motion

ITEM 2 (ICC-EC)
Committee Action: Disapproved
Committee Reason: The dictionary being proposed is not the only one available and there has been no justification submitted as to why it should be the one referenced. Dictionaries are not developed in accordance with ICC referenced standards procedures, however common dictionaries provide consistent definitions.

Assembly Action: No Motion

ITEM 3 (IECC)
Committee Action: Disapproved
Committee Reason: The code official should have the leeway to select whichever dictionary he wants to use. The committee found no reason to select this particular dictionary.

Assembly Action: No Motion

ITEM 4 (IFGC)
Committee Action: Disapproved
Committee Reason: There is no justification for the ICC codes to reference any specific dictionary. Common dictionaries provide consistent definitions.

Assembly Action: No Motion

ITEM 5 (IMC)
Committee Action: Disapproved
Committee Reason: The code official should not be forced to use this particular dictionary to resolve an interpretation. Many of the mechanical terms used in the IMC are not defined in Webster’s Third Edition.

Assembly Action: No Motion

ITEM 6 (IPC)
Committee Action: Approved as Submitted
Committee Reason: To provide a reference where terms are not defined in the code.

Assembly Action: Disapproved
ITEM 7 (IPMC)
Committee Action: Approved as Submitted
Committee Reason: To provide consistency with other I-Codes where terms are not defined in Chapter 2.

Assembly Action: No Motion

ITEM 8 (IPSDC)
Committee Action: Approved as Submitted
Committee Reason: To provide a reference where terms are not defined in the code.

Assembly Action: Disapproved

ITEM 9 (IRC)
Committee Action: Disapproved
Committee Reason: To be consistent with the action taken, on Item 1, by the IBC General Committee. There is no consensus on using this dictionary. If the same definitions occur in all dictionaries, then there is no reason to require one over the other. Webster’s may not provide the definitions needed in the building industry.

Assembly Action: No Motion

ITEM 10 (IZC)
Committee Action: Disapproved
Committee Reason: The code should not mandate a specific resource for terms not defined in the code.

Assembly Action: No Motion

ITEM 11 (IEBC)
Committee Action: Disapproved
Committee Reason: Any authorized dictionary should be acceptable and not just Webster’s.

Assembly Action: No Motion

**Individual Consideration Agenda:**

This Item 1 is on the agenda for individual consideration because a public comment was submitted.

**Public Comment 1:**

Cliff Skogstad, City of St. Michael, MN, representing Minnesota Building Officials, requests Approved as Submitted for Item 1.

Commenter’s Reason: The proponents reason had stated that this proposal had been approved the ICC Fire Code Development Committee at the 2001 Spring Code Hearings for inclusion in the IFC and he was seeking consistency with the other “I” Codes. The...

Analysis” comment from the ICC General Committee in the 2002 Spring Code Hearings monogram stated that the correlation of the added text should be decided by the membership. With the arguments that are presented to building officials it is imperative that words are clearly defined and understood. To only use the language of...

Item 6 is on the agenda for individual consideration because a public comment was submitted and an assembly action was successful.

**Public Comment 2:**

Gilbert Gonzalez, Murray City, UT, representing Utah Chapter of ICC, requests Disapproved for Item 6.

Commenter’s Reason: This change was disapproved for all the other codes. Item 6 should also be disapproved to maintain consistency with the others.

Item 7 is on the agenda for individual consideration because a public comment was submitted.

**Public Comment 3:**

Gilbert Gonzalez, Murray City, UT, representing Utah Chapter of ICC, requests Disapproved for Item 7.

Commenter’s Reason: This change was disapproved for all the other codes. Item 7 should also be disapproved to maintain consistency with the others.

Item 8 is on the agenda because a public comment was submitted and an assembly action was successful.

**Public Comment 4:**

Gilbert Gonzalez, Murray City, UT, representing Utah Chapter of ICC, requests Disapproved for Item 8.

Commenter’s Reason: This change was disapproved for all the other codes. Item 8 should also be disapproved to maintain consistency with the others.

Analysis: The following combinations of actions would achieve technical consistency among the International Codes included in this proposed code change:

1. All items AS  
2. All items D

**G10-02**  
202; IRC R202

**Proposed Change as Submitted:**

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. Revise as follows:

IBC SECTION 202 DEFINITIONS

BASEMENT. That portion of a building that is partly or completely below grade (see "Story," "Story Above Grade Plane" and Sections 502.1 and 1612.2).

2. Revise as follows:

IRC SECTION R202 DEFINITIONS

BASEMENT. That portion of a building that is partly or completely below grade (see "Story" and "Story Above Grade Plane").

Proponent’s Reason: This revision clarifies that a basement is actually a story of the building based on the definition of story also contained in Section 202. The application of the term “basement” is further clarified by the definition for “story above grade plane” (and IBC Section 502.1 for the IBC definition) as referenced in the definition for “basement”. This is basically an editorial code change to help clarify the code.

ITEM 1 (IBC)
Committee Action: Disapproved

Committee Reason: The proposed code change implies that there may be only a single basement in a building and appears to say that a basement is always a story when a basement may not be a story. The proposed change could also reduce the allowable number of stories in a building.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved

Committee Reason: The proponent requested the committee to disapprove.

Assembly Action: No Motion

Public Comment 2:

Ronald W. Clements, Jr., Chesterfield County, VA, representing Virginia Building and Code Officials, requests Approved as Submitted for Item 2.

Commenter’s Reason: Although the proponent requested disapproval of Item 2, which was consistent with the IBC General Committee’s action on Item 1 and caused no technical inconsistency between the IBC and IRC, Item 2 should now also be Approved as Submitted (along with Item 1; see Comment 1) to maintain technical consistency between the IBC and IRC.

Analysis: The following combinations of actions would achieve technical consistency between the IBC and the IRC:

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<tr>
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G12-02

302.1.1

Proposed Change as Submitted:

Proponent: Sarah A Rice, C.B.O., Schirmer Engineering Corp.

Revise as follows:

302.1.1 (Supp) Incidental use areas. Spaces which are incidental to the main occupancy shall be separated or protected, or both, in accordance with Table 302.1.1 or the building shall be classified as a mixed occupancy and comply with Section 302.3. Areas that are incidental to the main occupancy and shall be classified in accordance with the main occupancy of the portion of the building in which the incidental use area is located.

Exception: Incidental use areas within and serving a dwelling unit are not required to comply with this section.
Proposed Change as Submitted:


Revise as follows:

302.1.1.1 Separation. Where Table 302.1.1 requires a fire-resistance-rated separation, the incidental use area shall be separated from the remainder of the building with a fire barrier. Where Table 302.1.1 permits an automatic fire-extinguishing system without a fire barrier, the incidental use area shall be separated by a smoke partition construction capable of resisting the passage of smoke. The partitions shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling assembly or to the underside of the floor or roof deck above. Doors shall be self-closing or automatic closing upon detection of smoke. Doors shall not have air transfer openings and shall not be under cut in excess of the clearance permitted in accordance with NFPA 80.

Proponent's Reason: Last year the Fire Safety Committee approved the text pertaining to smoke partitions in anticipation that specific locations would be identified for the use of smoke partitions in future cycles. Based on the overstricken text in this proposal, it appears that this section alluded to and is applicable to the construction now identified by Section 710 as a smoke partition.

A smoke partition is a type of construction that is alluded to in the code, but not previously defined. Also, 1 hour rated assemblies have been reduced to 0 hours by a sprinkler trade-off. When the fire rating goes to zero, many other features which protect the occupants are also traded off. As a minimum, the limiting of the migration of smoke and toxic gases is essential to occupant safety and building damage mitigation, even with successful sprinkler activation. Automatic fire sprinklers are an effective method of preventing flashover during a building fire, however, not a method of limiting migrating smoke.

The toxicity and density of the smoke depends on what's burning and therefore difficult to quantify. For the purposes of this section, "tenable" is defined in this supporting statement as the ability to see an illuminated exit sign 30 feet away.

People tend to wait for information before initiating an orderly egress from a building fire. This time allows dangerous smoke to accumulate and hamper emergency exiting from the building. Behavioral studies and incident behavior interviews with fire victims indicate that people will venture about 12-14 feet into smoke before turning back. This depends on the density, acidity, and temperature of the smoke, but is confirmed in the UC, Canada and Great Britain. A person using the corridor for emergency egress needs a tenable atmosphere for a period of 20 minutes. The typical temperature in a sprinklered fire is about 400 F due to the evaporative cooling effect of the water droplets. Because it is cooler, sprinklered smoke is less buoyant and tends to completely fill the space between the floor and ceiling, not migrate along the ceiling like hot smoke from a post flashover fire. This smoke is difficult if not impossible to crawl under.

The "Routine to Calculate the Effects of Smoke Leakage into a Corridor: CESL", prepared by Dr. John Klote illustrates that a defined gag area of 0.1875 square inches (about the size of a pencil hole) through a wall will allow sufficient smoke migrate to create an untenable atmosphere in an 8 foot high x 44 inch wide corridor 40 feet long in just over 20 minutes.

1004.3.2 of the IBC clarifies that a corridor is intended to provide a direct access to an exit and therefore, needs to be smoke tenable. It is imperative that, even in non rated assemblies, minimum preventative measures be incorporated to limit migrating blinding...
smoke and incapacitating toxic gases for the egress routes to exits.

Committee Action: Disapproved

Committee Reason: The proposed code change, if approved, would require smoke dampers in duct air transfer openings based on Section 710.7 (Supp) where the current text of Section 302.1.1.1 requires none. It would also conflict with Section 710.5.2 (Supp) as to the door requirements in such separations. There is no reference to Section 710 in the proposed revised Section 302.1.1.1.

Assembly Action: Approved as Modified

Modify proposal as follows:

302.1.1.1 Separation. Where Table 302.1.1 requires a fire-resistance-rated separation, the incidental use area shall be separated from the remainder of the building with a fire barrier. Where Table 302.1.1 permits an automatic fire-extinguishing system without fire barrier walls or horizontal assemblies or both having a fire-resistance rating determined in accordance with Table 302.3.3 for uses being separated. Each fire area shall comply with the code based on the use of that space. Each fire area shall comply with the height limitations based on the use of that space and the type of construction classification. In each story, the building area shall be such that the sum of the ratios of the floor area of each use divided by the allowable area for each use shall not exceed 1.

Exception. Except for Group H and I-2 areas, where the building is equipped throughout with an automatic sprinkler system, installed in accordance with Section 903.3.1.1 or 903.3.1.2 the fire-resistance ratings in Table 302.3.3 shall be reduced by 1 hour but to not less than 1 hour and to not less than that required for floor construction according to the type of construction.


Revise as follows:

302.3.3 (Supp) Separated uses. Each portion of the building shall be individually classified as to use and shall be completely separated from adjacent areas by fire barrier walls or horizontal assemblies or both having a fire-resistance rating determined in accordance with Table 302.3.3 for uses being separated. Each fire area shall comply with the code based on the use of that space. Each fire area shall comply with the height limitations based on the use of that space and the type of construction classification. In each story, the building area shall be such that the sum of the ratios of the floor area of each use divided by the allowable area for each use shall not exceed 1.

Proposed Change as Submitted:

Committee Reason: Based on the proponent’s published reason and because this proposed change is an appropriate follow-up to code change F41-00 (AS) which deleted the specific prohibition on the use of NFPA 13 R systems in construction trade-offs when appropriate.
Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Charles Clark, AIA, P.E., National Concrete Masonry Association (NCMA), representing the Masonry Alliance for Codes and Standards (MACS) requests Disapproved.

Commenter’s Reason: We are submitting a Public Comment to request that this code change be disapproved because we do not believe it is appropriate to allow an NFPA 13R sprinkler system to be used for a construction trade-off in this situation. If this code change is approved, it will allow an occupancy separation between a Group R Occupancy and an adjacent occupancy that is sprinklered to be reduced by one-hour with the installation of an NFPA 13R sprinkler system. For example, this would allow an occupancy separation required to be of 2-hours between a Group R-1 and a Group R-4 occupancy to be reduced to 1-hour where both occupancies would be allowed to be protected with an NFPA 13R sprinkler system. Since an NFPA 13R sprinkler system is primarily a life safety system, in certain situations it may not provide adequate property protection, as does an NFPA 13 sprinkler system. Therefore, it should not be entitled to the reduction in the fire resistance rating of the occupancy separation. The occupancy separation provides both life safety and property protection. As such, it should not be allowed to be reduced in that case. This is especially critical where the occupancy separation may be adjacent to large unsprinklered concealed spaces in the occupancy protected with an NFPA 13R sprinkler system, such as in an attic or open truss or open joist floor-ceiling assembly. In those cases a fire could get into the concealed space and gain significant headway before it attacked the occupancy separation. If that occupancy separation is reduced by 1-hour as proposed by this code change, then there is a greater likelihood that the occupancy separation could be breached, thus jeopardizing the adjacent occupancy.

We were the proponent of Code Change G9-01 mentioned in the proponent’s reason. That code change was approved during the last code change cycle because it clarified that the exception to allow the reduction of 1-hour in the occupancy separation was only to apply to NFPA 13 sprinkler systems. That was always the intent of this section. In fact, that code change was not necessary until Code Change F41-00 deleted Section 903.1.2. Section 903.1.2 stated that modifications and trade-offs were not allowed for NFPA 13R and 13D sprinkler systems unless specifically noted. Thus, we submitted Code Change G9-01 and it was approved and is now included in the 2002 Accumulative Supplement to the IBC.

Finally, we would like to respond to the part of the proponent’s reason for the code change where he states that the types of buildings where the NFPA 13R sprinkler system would be used would, at most, require 1-hour fire resistive construction throughout which does not justify requiring higher fire resistance rated occupancy separations. That statement is totally unfounded and unjustified. There are many mixed occupancy buildings that have no fire-resistance ratings required throughout, yet still require 2 and 3-hour occupancy separations in the case where the separated use option in Section 302.3.3 is used. The occupancy separation is provided for fire and life safety reasons and is not based on the building type of construction. Otherwise, the same argument could be applied to most of the building types of construction, which do not require more than 1-hour fire-resistive construction throughout, thus negating the need for occupancy separations of more than 1-hour when the separated use provisions of Section 302.3 are used.

In conclusion, we strongly believe that this code change should be disapproved by the voting membership since it is inappropriate to utilize an NFPA 13R sprinkler system for a construction trade-off in this case.

Public Comment 2:

Gilbert Gonzales, Murray City Corp., representing Utah Chapter of ICC, requests Disapproved.

Commenter’s Reason: While this proposal has merit, the exception has unintended consequences and needs more consideration and evaluation before it is included in the code.

G25-02

302.3.3

Proposed Change as Submitted:

Proponent: Gregory R. Keith, Professional Heuristic Development; representing the Boeing Company

1. Delete Table (Supp) 302.3.3 contents and substitute as follows:
TABLE 302.3.3
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)\textsuperscript{a}

<table>
<thead>
<tr>
<th>GROUP</th>
<th>A, E</th>
<th>I, R</th>
<th>B, F-1, M, S-1</th>
<th>F-2, S-2, U</th>
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</table>

N = No separation requirement.
NP = Not permitted.
\textsuperscript{a} See Exceptions to Section 302.3.3 for permitted reductions in fire-resistance ratings.

2. Revise as follows:

302.3.3 (Supp) Separated uses. Each portion of the building shall be individually classified as to use and shall be completely separated from adjacent areas by fire barrier walls or horizontal assemblies or both having a fire-resistance rating determined in accordance with Table 302.3.3 for uses being separated. Each fire area shall comply with the code based on the use of that space. Each fire area shall comply with the height limitations based on the use of that space and the type of construction classification. In each story, the building area shall be such that the sum of the ratios of the floor area of each use divided by the allowable area for each use shall not exceed 1.

**Exceptions:**

1. Area is less than 10% of the floor area, or
2. Area is less than 1,000 square feet, or
3. Area is provided with an automatic fire-extinguishing system and is less than 3000 square feet.
4. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

Proponent’s Reason: At last year’s code development hearings in Portland, Oregon, the IBC General/Occupancies Committee corrected a major systems flaw by approving Item G14-01 as modified. The thrust of the action was to separate single occupancy fire area requirements from occupancy separation requirements. Previously, Table 302.3.3 addressed both occupancy separation and fire area requirements. The two issues are distinctly different. The creation of Table 706.3.6 and the assignment of appropriate fire-resistance rating requirements properly spoke to fire area threshold concerns.

Table 302.3.3 now appropriately addresses only occupancy separation requirements. Unfortunately, many of the fire-resistance rating requirements contained in the table reflect the fire area (fire loading) aspects of the former combined table. In actuality, occupancy separation requirements provide for a redundant level of safety for building occupants. Fundamental requirements for the provision of structural integrity of a building are, of course, contained in Table 601. The allowable areas and heights assigned to the various occupancy and type of construction combinations at Table 503 are based on the relative fire loading and other associated fire risk factors. Inasmuch as Section 302.3.3 requires that the determination of the allowable area of a mixed occupancy building be based on a sum of the ratios calculation, the relative fire loading will never exceed that assumed by the building code at its allowable area table. Egress times, of course, stand on their own merit and overlay other fire-resistance requirements. Exit access travel distance requirements translate into travel times expressed in minutes as opposed to hours. It could be argued based on the cumulative effect of the aforementioned technical provisions that no physical occupancy separation requirements are necessary.

Each of the former model building codes required some level of occupancy separation. The primary purpose of such occupancy separation is to provide for an additional level of occupant
safety based on dissimilar risk associated with the various occupancies. As previously stated, this is a redundant level of protection that accounts for intangibles. The proposed Table 302.3.3 is a clean sheet approach to the fundamental concept of occupancy separation. In fact, the proposed fire-resistance rating requirements fall in the middle of the three former model code tables. More importantly, they are based on common sense and support the prevailing system of layered building code requirements. The table encourages the use of an approved automatic sprinkler system consistent with many other code provisions. One noticeable feature of the proposed table is to group similar uses. For instance, the current Table 302.3.3 requires up to a 2 hour occupancy separation between various Group A and Group E occupancies. These occupancies are each people intensive in nature and have very similar fire loading and fire risk factors. Any difference in fire loading or risk potential is accounted for through the sum of the ratios calculation and occupancy specific means of egress requirements. The occupancy separation requirements between Group A and E occupancies and other people intensive Group R and Group I occupancies and other people intensive Group R and Group I occupancies provide an entirely appropriate level of temporal protection for the general safety of occupants and fire service personnel. The rating requirements established by the proposed table are relative to the various occupancies and support companion technical provisions.

Two such companion technical provisions are the accessory use area and nonseparated use requirements. Each of these provisions would allow for mixed occupancies not including Group H to exist without benefit of any occupancy separation under specified conditions. For example, the latter provision would fundamentally allow unseparated Group E and Group F-1 occupancies in a building of Type IIB construction where that building does not exceed the lesser allowable area of 14,500 square feet per floor. In this instance, the dissimilar risk associated with day care and ordinary hazard manufacturing occupancies is not addressed. Should the subject building exceed 14,500 square feet per floor, occupancy separation would be required based on the separated use provisions of Section 302.3.3. In this instance, a 2 hour occupancy separation would be required in a building equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1. It should be noted however, that the required sum of the ratios calculation would limit the allowable area of this building to a maximum of 15,500 square feet per floor. Assuming an area of 500 square feet for the Group E occupancy, based on the sum of the ratios calculation the area of the Group F-1 occupancy could not exceed 14,966 square feet per floor. The requirement for a 2 hour occupancy separation in a sprinklered building that exceeds the nonseparated use threshold by 466 square feet is excessive. The proposed table would require a 2 hour occupancy separation in a nonseparated building and a 1 hour occupancy separation in a sprinklered building. These requirements are more than commensurate compensation for any additional fire risk introduced by dissimilar occupancies.

Appropriately, the proposed table assigns higher occupancy separation requirements when high hazard (Group H) occupancies are involved. In these instances, the requirements are similar to the fire area separation requirements that are the basis for the current Table 302.3.3. It is felt that extreme redundancy is warranted in that design condition. On the other hand, certain more compatible occupancies may require no formal occupancy separation in sprinklered buildings. Other code provisions adequately control such instances.

Another feature of the proposal is to consolidate the footnotes to Table 302.3.3 with the exceptions to Section 302.3.3. This assists users in the proper application of code provisions.

In summary, this proposal corrects the final defect resulting from the dual purpose nature of the current Table 302.3.3. Now that the fire area aspect of the table was removed by previously approving Item G14-01, fire resistance ratings more appropriate to pure occupancy separation requirements have been provided.

Committee Reason: For consistency with the committee action of disapproving code changes G23-02 and G24-02 in large measure due to the lack of data to support the changes. Those proposed changes increased the requirements, while this proposal would decrease the requirements, however without sufficient data to support this change, it would be inconsistent to approve it.

Assembly Action: Approved as Modified-Motion Failed

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory R. Keith, Professional Heuristic Development, representing the Boeing Co., requests, Approved as Modified by this comment.

Replace the proposal with the following:

1. Delete current Table (Supp) 302.3.3 contents and substitute as follows:
TABLE 302.3.3
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)\(^a\)

<table>
<thead>
<tr>
<th>GROUP</th>
<th>A, E</th>
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<th>F-2, S-2, U</th>
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N = No separation requirement.
NP = Not permitted.
\(a\). See Exceptions to Section 302.3.3 for permitted reductions in fire-resistance ratings.

2. Revise current text as follows:

302.3.3 (Supp) Separated uses. Each portion of the building shall be individually classified as to use and shall be completely separated from adjacent areas by fire barrier walls or horizontal assemblies or both having a fire-resistance rating determined in accordance with Table 302.3.3 for uses being separated. Each fire area shall comply with the code based on the use of that space. Each fire area shall comply with the height limitations based on the use of that space and the type of construction classification. In each story, the building area shall be such that the sum of the ratios of the floor area of each use divided by the allowable area for each use shall not exceed 1.

Exceptions:

1. Except for Group H and I-2 areas, where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, the fire-resistance ratings in Table 302.3.3 shall be permitted to be reduced by 1 hour but not less than 1 hour and to not less than that required for floor construction according to the type of construction.

2. Areas used only for private or pleasure vehicles shall be permitted to be reduced by 1 hour.

3. The A private garage shall be permitted to be separated from the a residence and its attic area by means of a minimum ½ inch (12.7 mm) gypsum board applied to the garage side. Door openings between the garage and the residence shall be equipped with either solid wood doors not less than 1 3/8 inches (35 mm) thick or doors in compliance with Section 714.2.3. Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling residence from the garage shall be constructed of a minimum No. 26 gage (0.48 mm) sheet steel and shall have no openings into the garage. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted.

4. A separation is not required between a Group R-3 and a Group U carport provided the carport is entirely open on two or more sides and there are no enclosed uses above.

5. Occupancy separations need not be provided for incidental storage areas within Group B and M if the:

1. Area is less than 10% of the building area
2. Area is less than 1,000 square feet,
3. Area is provided with an automatic fire extinguishing system and is less than 3000 square feet.

6. Accessory assembly areas are not considered separate occupancies if the occupant load of such area is less than 50.

7. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

Commenter’s Reason: During the discussion of Item G25-02 in Pittsburgh, there was much support for the concepts embodied in the proposal (e.g. the table format and the organization of text requirements). Virtually all of the criticism of the proposal dealt with the values in the proposed Table 302.2.2. A representative of the health care industry felt that the elimination of institutional to residential separations was inappropriate. As a result of that comment those occupancies have been separated from each other. A representative of the semiconductor industry noted that the Group H-5 occupancy separation requirements were not consistent with the acknowledged level of risk associated with those occupancies. Appropriate alterations have been made in the modified table. Somewhat predictably, product representatives of certain materials associated with higher levels of fire resistivity were condemning the lower ratings contained in the proposed tables. There are no data that indicate that the lesser values contained in the table are inadequate. The proposed occupancy separations are equal to, or greater than, those formerly contained in the Uniform Building Code. There is no history of loss of life in former UBC jurisdictions as a result of inadequate occupancy separation.

Over the past few years a number of proponents have attempted to correct some fundamental inconsistencies in occupancy separation requirements that were a result of the consolidation of technical requirements contained in the three former model codes. The removal of fire area separation requirements from the occupancy separation table occurred last year and was an important first step in...
system correction. The remaining step is to require occupancy separation requirements consistent with the relative risk associated with the various separated occupancies. The modified proposal incorporates some of the concerns expressed in Pittsburgh. It is imperative that the format and system that is contained in this proposal be incorporated into the 2003 Edition of the International Building Code. To all intents and purposes it is companion to the work approved last year. There was considerable testimony in Pittsburgh that supported this assertion. It is recognized that some values in the table may be subject to debate. The proposed values provide a rational and relative requirement base that will serve future discussions. It is recommended that this proposal be approved and those parties that take issue with a given specific fire-resistance rating requirement—high or low—may submit proposals in the next code development cycle. The fundamental system embodied in this modified proposal will accommodate any and all future technical discussions as it places the requirements in technical context in conjunction with formerly approved Item G14-01.

G30-02
308.1

Proposed Change as Submitted:

Proponent: Ken Schoonover, P.E., KMS Associates

Revise as follows:

308.1 Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which people are cared for or live in a supervised environment, having physical limitations because of health or age are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

Proponent’s Reason: The current general definition for Group I does not include a description for Group I-1 or I-4.

Committee Action: Approved as Submitted

Committee Reason: Based on the proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle, requests Disapproved.
Jerry R. Tepe, FAIA, JRT-AIA Architect, representing the American Institute of Architects requests Approved as Modified by this comment.

Modify proposal as follows:

708.1 (Supp) General. Wall assemblies installed as required by Section 402.7.2 and 1004.3.2.1 shall comply with this section. These include: The following wall assemblies shall comply with this section:

1. Walls separating dwelling units in the same building.
2. Walls separating sleeping units in occupancies in Groups R-1 hotel occupancies, R-2 and I-1.
3. Walls separating sleeping units in covered mall buildings as required by Section 402.7.2.
4. Corridor walls as required by Section 1004.3.2.1.

710.3 (Supp) Fire-resistance rating. The fire-resistance rating of floor and roof assemblies shall not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 302.2.2 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 706.3.6. Floor assemblies separating dwelling units in the same building or sleeping units in occupancies in Groups R-1 hotel occupancies, R-2 and I-1 shall be a minimum of 1-hour fire-resistance-rated construction.

Exception: (No change to current text)

Commenter’s Reason: Construction requirements should not be located in Chapter 3 that classifies use and occupancy. It is not a normal place to look for these requirements. This proposal relocates the requirements into Section 708 Fire Partitions and 710 Horizontal Assemblies. Although some on the committee felt this should be in Table 601 (similar to BOCA), it was decided by the drafting committee to not locate this material in that Table.

G39-02
402

Proposed Change as Submitted:

Proponent: Kerwin Lee, Rolf Jensen & Associates

Revise as follows:

402.1 Scope. The provisions of this section shall apply to buildings or structures defined herein as covered mall buildings not exceeding three floor levels at any point nor more than three stories above grade. Except as specifically required by this section, covered mall buildings shall meet applicable provisions of this code.

When approved by the building code official, these provisions shall be allowed to be utilized for open mall complexes or shopping centers that are configured similar to a covered mall building, but without roofs over the common pedestrian area. Weather screening that allows natural ventilation is not considered a roof.

Exceptions:

1. and 2. (No change to current text)

402.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ANCHOR BUILDING. An exterior perimeter building of a Group other than H having direct access to a covered mall building or open mall complex but having required means of egress independent of the mall or open mall.

COVERED MALL BUILDING. (No change to current text)

FOOD COURT. A public seating area located in the mall or open mall that serves adjacent food preparation tenant spaces.

GROSS LEASABLE AREA. (No change to current text)

MALL. (No change to current text)

OPEN MALL. An unroofed common pedestrian way serving two or more tenants in a group of buildings that do not exceed three levels. Circulation at levels above grade may include open exterior balconies leading to stairs discharging at grade.

OPEN MALL COMPLEX. Several buildings housing a number of tenants such as retail stores, drinking and dining establishments, entertainment and amusement facilities, offices and other similar uses wherein two or more tenants have a main entrance into one or more open malls. For the purpose of this chapter, anchor buildings are not considered as a part of the open mall complex.

402.3 Lease plan. Each covered mall building or open mall complex owner shall provide both the building and fire departments with a lease plan showing the location of each occupancy and its exits after the certificate of occupancy has been issued. No modifications or changes in occupancy or use shall be made from that shown on the lease plan without prior approval of the building official.

402.4 Means of egress. Each tenant space and the covered mall building or open mall complex shall be provided with means of egress as required by this section and this code. Where there is a conflict between the requirements of this code and the requirements of this section, the requirements of this section shall apply.
402.4.1 Determination of occupant load. The occupant load permitted in any individual tenant space in a covered mall building or open mall complex shall be determined as required by this code. Means of egress requirements for individual tenant spaces shall be based on the occupant load thus determined.

402.4.1.1 Occupant formula. In determining required means of egress of the mall or open mall, the number of occupants for whom means of egress are to be provided shall be based on gross leasable area of the covered mall building or open mall complex (excluding anchor buildings) and the occupant load factor as determined by the following equation.

\[ OLF = (0.00007)(GLA) + 25 \]  

where:

- \( OLF \) = The occupant load factor (square feet per person).
- \( GLA \) = The gross leasable area (square feet).

402.4.1.2 OLF range. (No current change to text)

402.4.1.3 Anchor buildings. The occupant load of anchor buildings opening into the mall or open mall shall not be included in computing the total number of occupants for the mall or open mall.

402.4.1.4 Food courts. The occupant load of a food court shall be determined in accordance with Section 1003. For the purposes of determining the means of egress requirements for the mall or open mall, the food court occupant load shall be added to the occupant load of the covered mall building as calculated above.

402.4.2 Number of means of egress. Wherever the distance of travel to the mall or open mall from any location within a tenant space used by persons other than employees exceeds 75 feet (22 860 mm) or the tenant space exceeds an occupant load of 50, not less than two means of egress shall be provided.

402.4.3 Arrangements of means of egress. Assembly occupancies with an occupant load of 500 or more shall be so located in the covered mall building that their entrance will be immediately adjacent to a principal entrance to the mall and shall have not less than one-half of their required means of egress opening directly to the exterior of the covered mall building. There is no restriction on locating similar assemblies in open mall complexes.

402.4.3.1 Anchor building means of egress. Required means of egress for anchor buildings shall be provided independently from the mall or open mall means of egress system. The occupant load of anchor buildings opening into the mall or open mall shall not be included in determining means of egress requirements for the mall or open mall. The path of egress travel of malls or open malls shall not exit through anchor buildings. Malls or open malls terminating at an anchor building where no other means of egress has been provided shall be considered as a dead-end mall or open mall.

402.4.4 Distance to exits. Within each individual tenant space in a covered mall building or open mall complex, the maximum distance of travel from any point to an exit or entrance to the mall or open mall shall not exceed 200 feet (60 960 mm).

The maximum distance of travel from any point within a mall to an exit shall not exceed 200 feet (60 960 mm). The maximum distance of travel from any point within an open mall shall not exceed 400 feet for levels not at grade, and may be unlimited at grade.

402.4.5 Access to exits. Where more than one exit is required, they shall be so arranged that it is possible to travel in either direction from any point in a mall or open mall to separate exits. The minimum width of an exit passageway or corridor from a mall or open mall shall be 66 inches (1676 mm).

Exception: Dead ends not exceeding a length equal to twice the width of the mall or open mall measured at the narrowest location within the dead-end portion of the mall, or open mall.

402.4.5.1 Exit passageway enclosures. (No change to current text)

402.4.6 Service areas fronting on exit passageways, and corridors. (No change to current text)

402.5 Mall width. For the purpose of providing required egress, malls or open malls may be considered as corridors but need not comply with the requirements of Section 1003.2.3 of this code where the width of the mall is as specified in this section.

402.5.1 Minimum width. The minimum width of the mall or open mall shall be 20 feet (6096 mm). The mall or open mall width shall be sufficient to accommodate the occupant load served. There shall be a minimum of 10 feet (3048 mm) clear exit width to a height of 8 feet (2438 mm) between any projection of a tenant space bordering the mall or open mall and the nearest kiosk, vending machine, bench, display opening, food court or other obstruction to means of egress travel.

402.6 Types of construction. The area of any covered mall building or open mall complex, including anchor buildings of Types I, II, III and IV construction, shall not be limited provided the covered mall building or open mall...
mall complex and attached anchor buildings and parking structures are surrounded on all sides by a permanent open space of not less than 60 feet (18,288 mm).

402.7 Fire-resistance-rated separation. Fire-resistance-rated separation is not required between tenant spaces and the mall or open mall. Fire-resistance-rated separation is not required between a food court and adjacent tenant spaces, mail, or open mall.

402.7.1 Attached garage. An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and open parking garages shall be considered as separate buildings where they are separated from the covered mall building or open mall complex by a fire barrier having a fire-resistance rating of at least 2 hours.

Exception: Where an open parking garage is separated from the covered mall building or open mall complex a distance greater than 10 feet (3048 mm), the provisions of Table 602 shall apply. Pedestrian walkways and tunnels that attach the open parking garage to the covered mall building or open mall complex shall be constructed in accordance with Section 3104.

402.7.2 Tenant separations. Each tenant space shall be separated from other tenant spaces by a fire partition complying with Section 708. A tenant separation wall is not required between any tenant space and the mall or open mall except for occupancy separations required elsewhere in this code.

402.7.2.1 Openings between anchor building and mall. Except for the separation between Group R-1 sleeping rooms and the mall or open mall, openings between anchor buildings of Types IA, IB, IIA and IIB construction and the mall or open mall need not be protected.

[F] 402.8 Automatic sprinkler system. The covered mall building or open mall complex and buildings connected shall be provided throughout with a standpipe system in accordance with Section 905.

402.9 Smoke control. A smoke control system shall be provided where required for atriums in Section 404. No smoke control system is required in an open mall complex.

402.10 Kiosks. Kiosks and similar structures (temporary or permanent) shall meet the following requirements:

1. Combustible kiosks or other structures shall not be located within the mall or open mall unless constructed of fire-retardant-treated wood.
2. through 4. (No change to current text)

402.11 Security grilles and doors. (No change to current text)

402.12 Standby power. Covered mall buildings or open mall complexes exceeding 50,000 square feet (4645 m2) shall be provided with standby power systems that are capable of operating the emergency voice/alarm communication system.

[F] 402.13 Emergency voice/alarm communication system. Covered mall buildings or open mall complexes exceeding 50,000 square feet (4645 m2) in total floor area shall be provided with an emergency voice/alarm communication system. Emergency voice/alarm communication systems serving a mall or open mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section 907.2.12.2.

402.14 Plastic signs. Within every store or level and from side wall to side wall of each tenant space facing the mall or open mall, plastic signs shall be limited as specified in Sections 402.14.1 through 402.14.5.

402.14.1 Area. Plastic signs shall not exceed 20 percent of the wall area facing the mall or open mall.

402.14.2 Height and width. (No change to current text)

402.14.3 Location. (No change to current text)

402.14.4 Plastics other than foam plastics. (No change to current text)

402.14.4.1 Encasement. (No change to current text)

402.14.5 Foam plastics.
402.15 Fire department access to equipment.  
(No change to current text)

Proponent’s Reason:  The purpose of the proposed changes is to provide a code process for addressing covered mall types of building projects that do not have a roof over the common pedestrian circulation area. Projects of this type are not uncommon, particularly in the “sun belt” areas of the country and in similar climates around the world. These projects should have the same benefits from the covered mall provisions, since an open-to-the- sky mall provides equivalent or better life safety and property protection that the same building configuration with a roof.

Committee Action:  Disapproved

Committee Reason:  While addressing a valid concept, there needs to be a more thorough analysis of the differences in hazard between an open mall and a covered mall in order to better justify the proposed change, particularly the application of the covered mall provisions to an open mall. The definitions need to be simplified and made more understandable. In Section 402.9, waiving smoke control for the open mall tenant spaces is questionable. In Section 402.4.4, the increased travel distance has not been adequately justified. The uniqueness of open malls can just as easily be handled on a case-by-case basis as an alternative method in accordance with Section 104.

Assembly Action:  No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kerwin Lee, AIA, Rolf Jensen & Associates, requests Approved as Modified by this comment.

Replace the proposal with the following:

402.1 Scope.  The provision of this section shall apply to buildings or structures defined herein as covered mall buildings or shopping centers that are configured similarly to a covered mall building, but without roofs over the common pedestrian area.

When approved by the building official, these provisions shall be allowed to be utilized for open mall buildings or shopping centers that are configured similarly to a covered mall building.

Exceptions:  1. and 2.  (No change to current text)

402.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ANCHOR BUILDING.  An exterior perimeter building of a Group other than H having direct access to a covered mall building or open mall building, but having required means of egress independent of the mall or open mall.

COVERED MALL BUILDING.  (No change to current text)

FOOD COURT.  A public seating area located in the mall or open mall that serves adjacent food preparation tenant spaces.

GROSS LEASABLE AREA.  (No change to current text)

MALL.  (No change to current text)

OPEN MALL.  An unroofed common pedestrian way serving a number of tenants not exceeding three levels. Circulation at levels above grade may include open exterior balconies leading to exits discharging at grade. The minimum roof opening width shall be 20 feet.

OPEN MALL BUILDING.  Several structures housing a number of tenants such as retail stores, drinking and dining establishments, amusement and amusement facilities, offices, and other similar uses wherein two or more tenants have a main entrance into one or more open malls. For the purpose of this chapter, anchor buildings are not considered as a part of the open mall building.

402.3 Lease plan.  Each covered mall building or open mall building owner shall provide both the building and fire departments with a lease plan showing the location of each occupancy and its exits after the certificate of occupancy has been issued. No modifications or changes in occupancy or use shall be made from that shown on the lease plan without prior approval of the building official.

402.4 Means of egress.  Each tenant space and the covered mall building or open mall building shall be provided with means of egress as required by this section and this code. Where there is a conflict between the requirements of this code and the requirements of this section, the requirements of this section shall apply.

402.4.1 Determination of occupant load.  The occupant load permitted in any individual tenant space in a covered mall building or open mall building shall be determined as required by this code. Means of egress requirements for individual tenant spaces shall be based on the occupant load thus determined.

402.4.1.1 Occupant formula.  In determining required means of egress of the mall or open mall, the number of occupants for whom means of egress are to be provided shall be based on gross leasable area of the covered mall building or open mall building (excluding anchor buildings) and the occupant load factor as determined by the following formula.

\[ \text{OLF} = (0.00007) \times \text{GLA} + 25 \]  
(Equation 4-1)

where:

\[ \text{OLF} = \text{The occupant load factor (square feet per person)} \]

\[ \text{GLA} = \text{The gross leasable area (square feet)} \]

402.4.1.2 OLF range.  
(No change to current text)

402.4.1.3 Anchor buildings.  The occupant load of anchor buildings opening into the mall or open mall shall not be included in computing the total number of occupants for the mall or open mall.

402.4.1.4 Food courts.  The occupant load of a food court shall be
determined in accordance with Section 1003. For the purposes of determining the means of egress requirements for the mall or open mall, the food court occupant load shall be added to the occupant load of the covered mall buildings or open mall building as calculated above.

402.4.2 Number of means of egress. Wherever the distance of travel to the mall or open mall from any location within a tenant space used by persons other than employees exceeds 75 feet (22.86 m) or the tenant space exceeds an occupant load of 50, not less than two means of egress shall be provided.

402.4.3 Arrangements of means of egress. Assembly occupancies with an occupant load of 500 or more shall be so located in the covered mall building that their entrance will be immediately adjacent to a principal entrance to the mall and shall have not less than one-half of their required means of egress opening directly to the exterior of the covered mall building. There is no restriction on locating similar assemblies in open mall buildings.

402.4.3.1 Anchor building means of egress. Required means of egress for anchor buildings shall be provided independently from the mall or open mall means of egress system. The occupant load of anchor buildings opening into the mall or open mall shall not be included in determining means of egress requirements for the mall or open mall. The path of egress travel of malls or open malls shall not exit through anchor buildings. Malls or open malls terminating at an anchor building where no other means of egress has been provided shall be considered as a dead-end mall or open mall.

402.4.4 Distance to exits. Within each individual tenant space in a covered mall building or open mall building, the maximum distance of travel from any point to an exit or entrance to the mall or open mall shall not exceed 200 feet (60.96 m).

The maximum distance of travel from any point within a mall to an exit shall not exceed 200 feet (60.96 m).

402.4.5 Access to exits. Where more than one exit is required, they shall be so arranged that it is possible to travel in either direction from any point in a mall or open mall to separate exits. The minimum width of an exit passageway or corridor from a mall or open mall shall be 66 inches (1676 mm).

Exception: Dead ends not exceeding a length equal to twice the width of the mall or open mall measured at the narrowest location within the dead-end portion of the mall, or open mall.

402.4.5.1 Exit passageway enclosures.

(No change to current text)

402.4.6 Service areas fronting on exit passageways, and corridors.

(No change to current text)

402.5 Mall width. For the purpose of providing required egress, malls or open malls may be considered as corridors but need not comply with the requirements of Section 1003.2.3 of this code where the width of the mall is as specified in this section.

402.5.1 Minimum width. The minimum width of the mall or open mall shall be 20 feet (6096 mm). The mall or open mall width shall be sufficient to accommodate the occupant load served. There shall be a minimum of 10 feet (3048 mm) clear exit width to a height of 8 feet (2438 mm) between any projection of a tenant space bordering the mall or open mall and the nearest kiosk, vending machine, bench, display opening, food court or other obstruction to means of egress travel.

402.6 Types of construction. The area of any covered mall building or open mall building, including anchor buildings, of Types I, II, III and IV construction shall not be limited provided the covered mall building or open mall building and attached anchor buildings and parking structures are surrounded on all sides by a permanent open space of not less than 60 feet (18 288 mm).

402.7 Fire-resistance-rated separation. Fire-resistance-rated separation is not required between tenant spaces and the mall or open mall. Fire-resistance-rated separation is not required between a food court and adjacent tenant spaces, mall, or open mall.

402.7.1 Attached garage. An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and open parking garages shall be considered as a separate building where they are separated from the covered mall building or open mall building by a fire barrier having a fire-resistance rating of at least 2-hours.

Exception: Where an open parking garage is separated from the covered mall building or open mall building a distance greater than 10 feet (3048 mm) the provisions of Table 602 shall apply. Pedestrian walkways and tunnels that attach the open parking garage to the covered mall building or open mall building shall be constructed in accordance with Section 3104.

402.7.2 Tenant separations. Each tenant space shall be separated from other tenant spaces by a fire partition complying with Section 708. A tenant separation wall is not required between any tenant space and the mall or open mall except for occupancy separations required elsewhere in this code.

402.7.2.1 Openings between anchor building and mall or open mall. Except for the separation between Group R-1 sleeping rooms and the mall or open mall, openings between anchor buildings of Types IA, IB, IIA and IIB construction and the mall or open mall need not be protected.

[F] 402.8 Automatic sprinkler system. The covered mall building or open mall building and buildings connected shall be provided throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, which shall comply with the following:

1. The automatic sprinkler system shall be complete and operative throughout occupied space in the covered mall building or open mall building prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with approved alternate protection.

2. Sprinkler protection for the mall shall be independent from that provided for tenant spaces or anchors. Where tenant spaces are supplied by the same system, they shall be independently controlled.

Exception: An automatic sprinkler system shall not be required in spaces or areas of open parking garages constructed in accordance with Section 406.2.

[F] 402.8.1 Standpipe system. The covered mall building or open mall building and other buildings connected shall be provided throughout with a standpipe system in accordance with Section 905.

402.9 Smoke control. A smoke-control system shall be provided where required for atriums in Section 404. No smoke control system is required in an open mall building.

402.10 Kiosks. Kiosks and similar structures (temporary or permanent) shall meet the following requirements:

1. Combustible kiosks or other structures shall not be located within the mall or open mall unless constructed of fire-retardant treated wood.

2. Kiosks or similar structures located within the mall or open mall shall be provided with approved fire suppression and detection devices.

3. The minimum horizontal separation between kiosks and similar structures within the mall or open mall shall be 20 feet (6096 mm).

4. Each kiosk or similar structure shall have a maximum area of 300 square feet (28 m²).

402.11 Security grilles and doors. (No change to current text)

402.12 Standby power. Covered mall buildings or open mall
buildings exceeding 50,000 square feet (4645 m²) shall be provided with standby power systems that are capable of operating the emergency voice/alarm communication system.

[F] 402.13 Emergency voice/alarm communication system. Covered mall buildings or open mall buildings exceeding 50,000 square feet (4645 m²) in total floor area shall be provided with an emergency voice/alarm communication system. Emergency voice/alarm communication systems serving a mall or open mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section 907.2.1.2.2.

402.14 Plastic signs. Within every store or level and from side wall to side wall of each tenant space facing the mall or open mall, plastic signs shall be limited as specified in Sections 402.1.4.1 through 402.1.4.5.

402.14.1 Area. Plastic signs shall not exceed 20 percent of the wall area facing the mall or open mall.

402.14.2 Height and width. (No change to current text)

402.14.3 Location. (No change to current text)

402.14.4 Plastic other than foam plastics. (No change to current text)

402.14.4.1 Encasement. (No change to current text)

402.14.5 Foam plastics. (No change to current text)

402.14.5.1 Density. (No change to current text)

402.14.5.2 Thickness. (No change to current text)

402.15 Fire department access to equipment. (No change to current text)

Commenter’s Reason: We have responded to the committee’s and floor comments to clarify the definition of an open mall and open mall building. The key to this concept is to have a covered mall building without a roof over the mall area. We have added in the definition of an open mall a minimum dimension of 20 feet. This dimension aligns with Section 402.5.1, minimum mall width for egress. This provides a dimensional value for the open portion. Although we feel that an additional travel distance is justified for an open mall, the proposed change to Section 402.4.4 has been deleted.

Section 402.9 refers to Section 404, Atriums, for smoke control. When a mall becomes three levels, smoke control is required. The change removes the requirement for smoke control in an open mall. Without a roof over the mall area, natural ventilation is provided and smoke control is no longer necessary. This would include smoke control for the tenant spaces. The main reason for smoke control is to maintain a tenable environment in the mall area.

G44-02

402.7.3 (new); 402.7.2.1

Proposed Change as Submitted:


1) Add new text as follows:

402.7.3 Anchor buildings separation. An anchor building shall be separated from the covered mall building by fire walls complying with Section 705.

Exception: Anchor buildings of not more than three stories above grade which use and occupancy classification are of the same uses permitted as tenants of the covered mall building shall be separated by 2-hour fire resistive fire barriers complying with Section 705.

2) Revise as follows:

402.7.2.4 402.7.3.1 (Supp) Openings between anchor buildings and mall. Except for the separation between Group R-1 sleeping units and the mall, openings between anchor buildings of Types IA, IB, IIA and IIB construction and the mall need not be protected.

Proponent’s Reason: This section will clarify the type of separation that is necessary and should be required between anchor buildings and the covered mall building. If an anchor building is classified as an occupancy that by definition is permissible as a portion of the covered mall building, then these occupancies could be considered either a tenant space or an anchor building depending on the exiting concept. The only distinguishing feature would be that as an anchor building, the exits are designed to be independent of the covered mall while if considered a tenant space they would utilize the covered mall for exiting. Since independent exiting on these larger spaces is reasonable, and in most cases more desirable thereby reducing the needed exit flow into the mall, there is no reason to penalize anchor buildings by requiring fire walls to separate the same occupancies contained in both the anchor building and in the covered mall building.

Based on this rationale, a fire barrier wall of 2-hour rating will provide satisfactory separation. When comparing the uses permitted in covered mall buildings and the required separation of these occupancies from each other as documented in Table 302.3.3, you will note that none of these occupancies require greater than a 2-hour rating. This code change would require occupancies that required no separation or a 1-hour separation to provide a 2-hour rated fire barrier, therefore providing an additional level of protection. This code section clarifies that any other anchor buildings of other occupancy classifications would be required to be separated by fire walls constructed in accordance with Section 705. This code change would also help resolve the issue that existing malls constructed in compliance with the provisions of the Standard Building Code (which did not require a fire wall separation between anchor stores and the covered mall) or the UBC (area separation wall which did not require these walls to have structural independence as required by Section 705) from being in violation of the current IBC code provisions. Therefore, this change will address the complexities of these many existing mall buildings.

Committee Action: Approved as Modified

Modify proposal as follows:

402.7.3 Anchor buildings separation. An anchor building shall be separated from the covered mall building by fire walls complying with
Section 705.

Exception: Anchor buildings of not more than three stories above grade which use and occupancy classification are of the same uses permitted as tenants of the covered mall building shall be separated by 2-hour fire resistive fire barriers complying with Section 706.

402.7.3 Anchor buildings separation. An anchor building shall be separated from the covered mall building by fire walls complying with Section 705.

Exception: Anchor buildings of not more than three stories above grade which use and occupancy classification are of the same uses permitted as tenants of the covered mall building shall be separated by 2-hour fire resistive fire barriers complying with Section 706.

402.7.3.1 (Supp) Openings between anchor buildings and mall. Except for the separation between Group R-1 sleeping units and the mall, openings between anchor buildings of Types IA, IB, IIA and IIB construction and the mall need not be protected.

Committee Reason: Based on the proponent’s published reason. The modification provides a correct section reference for fire barrier requirements.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Maureen Traxler, City of Seattle, requests Approved as Modified by this comment.

Modify proposal as follows:

402.7.3 Anchor buildings separation. An anchor building shall be separated from the covered mall building by fire walls complying with Section 705.

Exception: Anchor buildings of not more than three stories above grade which use and occupancy classification are of the same uses permitted as tenants of the covered mall building shall be separated by 2-hour fire resistive fire barriers complying with Section 706 if the anchor building is of the same use and occupancy classification as one or more tenants of the covered mall building as identified on the Certificate of Occupancy or lease plan.

402.7.3.1 (Supp) Openings between anchor buildings and mall. Except for the separation between Group R-1 sleeping units and the mall, openings between anchor buildings of Types IA, IB, IIA and IIB construction and the mall need not be protected.

Commenter’s Reason: The wording of this proposal (“permitted as tenants”) is confusing since the IBC does not restrict the uses or occupancies allowed or permitted in covered mall buildings. As we understand the proponent’s intent, the word “permitted” in this case refers to the uses specified on the permit for the mall building rather than the uses allowed in covered mall buildings.

Public Comment 2:

Charles Clark, AIA, P.E., National Concrete Masonry Association (NCMA), representing the Masonry Alliance for Codes and Standards (MACS), requests Approved as Modified by this comment.

Modify proposal as follows:

402.7.3 Anchor buildings separation. An anchor building shall be separated from the covered mall building by fire walls complying with Section 705.

Exception: Anchor buildings of not more than three stories above grade which use and occupancy classification are of the same uses permitted as tenants of the covered mall building shall be separated by 2-hour fire resistive fire barriers complying with Section 706.

402.7.3.1 (Supp) Openings between anchor buildings and mall. Except for the separation between Group R-1 sleeping units and the mall, openings between anchor buildings of Types IA, IB, IIA and IIB construction and the mall need not be protected.

Commenter’s Reason: We are submitting this Public Comment to revise this code change to delete the exception that would allow an anchor building to be separated from a covered mall building by a fire barrier wall rather than a fire wall under certain conditions. This is because we believe anchor buildings are truly separate buildings which are defined by fire walls separating them from adjacent buildings in accordance with Section 705. Therefore, proposed new Section 402.7.3 is entirely correct and appropriate. However, the proposed exception is not.

The code clearly intends that anchor buildings be treated as separate buildings for several reasons. First, the definition for anchor buildings states:

"An exterior perimeter building…"

The definition for covered mall buildings states:

“A single building… For the purposes of this chapter (Chapter 4), anchor buildings shall not be considered as part of the covered mall building.”

This is further supported in Section 402.6 Types of Construction as revised in the 2002 Accumulative Supplement which clarifies that anchor buildings are treated as separate buildings for determining the allowable types of construction based on building height.

The question also arises as to how this exception would apply if there is a property line between the anchor building and the covered mall building. Fire walls are suitable for separating buildings at property lines as allowed by Section 503.2 which calls them party walls which must meet the requirements of Section 705 for Fire walls. However, the code does not permit a fire barrier wall to be used for this purpose. Yet the exception will appear to allow anchor buildings not more than 3-stories in height to be separated at a property line by a 2-hour fire-resistive fire barrier.

Furthermore, it should be noted that both the 1997 ICBO Uniform Building Code (UBC) and the 1999 BOCA National Building Code (NBC) treat anchor stores (buildings) as separate buildings also. For these reasons, the exception is totally inappropriate since it would allow certain anchor buildings to be separated from the covered mall building by a 2-hour fire-resistive fire barrier, whereas, it should be separated by a 3-hour fire-resistive fire wall. Thus, the exception would allow a reduction of 1-hour in the fire resistance rating of the separation and would also permit the use of a fire barrier in lieu of a fire wall. Yet a fire barrier wall does not provide the necessary structural stability and complete physical separation that establishes separate buildings, as does a fire wall.

For all these reasons, we urge the voting membership to approve this code change as modified by this Public Comment.

Public Comment 3:

Ronald W. Clements, Jr., Chesterfield County, VA representing Virginia Building and Code Officials
Association requests Disapproved.

Commenter's Reason: The last sentence of the definition of “covered mall building” states, “For purposes of this chapter, anchor buildings shall not be considered as a part of the covered mall building.” Since the anchor building and covered mall building must be treated as separate buildings, the code explicitly requires that the two buildings be separated by a fire wall, or each building must have an exterior wall complying with the requirements of Section 705 based on zero fire separation distance. Therefore, the exception that will allow a fire barrier wall to separate the two buildings is a violation of the code. Rather than attempting to fix the defective proposal with a modification, it should be disapproved.

G50-02
403.3, 403.3.1, 403.3.2

Proposed Change as Submitted:

Proponent: Barry N. Gupton, P.E., North Carolina Department of Insurance; representing SBCCI Means of Egress, Code Action Committee

Revise as follows:

403.3 Reduction in fire-resistance rating. The fire-resistance-rating reductions listed in Sections 403.3.1 and 403.3.2 shall be allowed in buildings that have sprinkler control valves equipped with supervisory initiating devices and water-flow initiating devices for each floor.

403.3.1 Type of construction. The following reductions in the minimum construction type allowed in Table 601 shall be allowed as provided in Section 403.3:

1. Type IA construction shall be allowed to be reduced to Type IB.
2. In other than Groups F-1, M and S-1, Type IB construction shall be allowed to be reduced to Type IIA.

403.3.2 Shaft enclosures. The required fire-resistance rating of the fire barrier walls enclosing vertical shafts, other than exit enclosures and elevator hoistway enclosures, shall be reduced to 1 hour where automatic sprinklers are installed within the shafts at the top and at alternate floor levels.

Proponent’s Reason: Section 403.3.1(2) permits a reduction in the fire resistance rating of Type IB construction down to Type IIA construction. This lower type of construction requires only 1-hour protection of the beams, columns and floor systems. Effectively, the allowable height of Groups A-2, A-3, A-4, B, F-2, R-1, R-2, R-3, R-4 and S-2 is increased by as much as 8-stories on buildings with reduced fire resistance. The allowable height in feet is also increased from 65-feet to 160-feet. Arguments have been made that 1-hour fire resistance is adequate to evacuate these buildings in a timely manner. Consider the fire that occurs on the 8th floor of an 11-story, Type IIA hotel building. The occupants of the 9th, 10th, and 11th floors may have to remain in place until emergency personnel can assist their evacuation. The rescue operation will have to be staged from the inside of the building with only 1-hour protection of the structural systems. Section 403.3.2 has no basis and should be deleted along with Section 403.3.1(2). Section 707.4 requires 2-hour shaft protection in Type I construction.

Committee Action: Disapproved

Committee Reason: The one hour reduction in fire resistance rating for sprinklers concept has been used successfully since it was first introduced by New York City in the early 1970’s and the current text has existed through two drafts of the IBC and a number of code change cycles without being challenged. The basis for overturning a proven code provision has not been portrayed. The current text has within it an implicit 160 foot height limit and is adequate as written.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tony Crimi, A.C. Consulting Solutions, Inc., representing the International Firestop Council, requests Approved as Submitted.

Commenter’s Reason: Section 403.3.1(2) permits a reduction in the fire resistance rating of Type IB construction down to Type IIA construction. This lower type of construction requires only 1-hour protection of the beams, columns and floor systems. Effectively, the allowable height of Groups A-2, A-3, A-4, B, F-2, R-1, R-2, R-3, R-4 and S-2 is increased by as much as 8-stories on buildings with reduced fire resistance. The allowable height in feet is also increased from 65-feet to 160-feet. Arguments have been made that 1-hour fire resistance is adequate to evacuate these buildings in a timely manner. Consider the fire that occurs on the 8th floor of an 11-story, Type IIA hotel building. The occupants of the 9th, 10th, and 11th floors may have to remain in place until emergency personnel can assist their evacuation. The rescue operation will have to be staged from the inside of the building with only 1-hour protection of the structural systems. Section 403.3.2 has no basis and should be deleted along with Section 403.3.1(2). Section 707.4 requires 2-hour shaft protection in Type I construction.

We believe that Type IIA Construction provides inadequate passive fire protection for an 11 story high-rise building.

G51-02
403.3 (new)

Proposed Change as Submitted:

Proponent: Barry N. Gupton, P.E., North Carolina Department of Insurance; representing SBCCI Means of Egress, Code Action Committee

Add new text as follows:

floors may have to remain in place until emergency personnel can assist their evacuation. The rescue operation will have to be staged from the inside of the building with only 1-hour protection of the structural systems. Section 403.3.2 has no basis and should be deleted along with Section 403.3.1(2). Section 707.4 requires 2-hour shaft protection in Type I construction.

Committee Action: Disapproved

Commenter’s Reason: The last sentence of the definition of “covered mall building” states, “For purposes of this chapter, anchor buildings shall not be considered as a part of the covered mall building.” Since the anchor building and covered mall building must be treated as separate buildings, the code explicitly requires that the two buildings be separated by a fire wall, or each building must have an exterior wall complying with the requirements of Section 705 based on zero fire separation distance. Therefore, the exception that will allow a fire barrier wall to separate the two buildings is a violation of the code. Rather than attempting to fix the defective proposal with a modification, it should be disapproved.
403.3 Smoke control system. A smoke control system shall be provided to control the migration of products of combustion in accordance with Section 909 and the provisions of this section. The smoke control system shall restrict movement of smoke to the area of fire origin and maintain means of egress in a usable condition.

Proponent’s Reason: This proposal is to add smoke control requirements to high-rise buildings (the same as for underground buildings) since the same life-safety concerns are present. The floor areas must offer a tenable environment for the occupants either during exit access or during the time of refuge while awaiting emergency personnel. Smoke control may be accomplished by either mechanical ventilation, natural ventilation or passive barriers.

Common gravity effects of air movement, particularly in tall buildings, are significant in causing the products of combustion to travel well beyond the fire source. In addition, unless there are requirements for specific design consideration to address the hazard, threat to life in areas remote to the fire, is much more likely to occur. With respect to smoke hazards in high-rise buildings, the current IBC only requires pressurized stairs and their entrance vestibules in high-rise buildings. Not only can stack effect cause unwanted smoke spread, but in structures with minimal exterior openings, purging smoke can be virtually impossible. Why should these major facilities be any less protected than atria or malls? The proposal requires the hazard to be addressed in a more comprehensive system as outlined in Section 909.

Committee Action: Disapproved

Committee Reason: Smoke control as portrayed in the proposed code change is not a life safety issue but rather one of property protection which is inconsistent with the scope and purpose of such systems as stated in Section 909.1. Such a requirement would add substantially to the design, construction and maintenance costs of buildings. There are no statistics to support this requirement and no research data been provided to the committee.

Assembly Action: No Motion

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Barry N. Gupton, P.E., North Carolina Department of Insurance, representing the N.C. Office of State Fire Marshal, requests Approved as Submitted.

Commenter’s Reason: This proposal is to add smoke control requirements to high-rise buildings (the same as for underground buildings) since the same life-safety concerns are present. The floor areas must offer a tenable environment for the occupants either during exit access or during the time of refuge while awaiting emergency personnel. Smoke control may be accomplished by either mechanical ventilation, natural ventilation or passive barriers.

O132-99. Common gravity effects of air movement, particularly in tall buildings, are significant in causing the products of combustion to travel well beyond the fire source. In addition, unless there are requirements for specific design consideration to address the hazard, threat to life in areas remote to the fire, is much more likely to occur. With respect to smoke hazards in high-rise buildings, the current IBC draft requires only that smoke proof stair enclosures be installed. The proposal requires the hazard to be addressed in a more comprehensive system as outlined in Section 909.

The IBC is deficient in several areas of smoke control. I urge your support and approval of this amendment. This is your final opportunity to correct this deficiency in high-rise smoke control for the 2003 edition.

Public Comment 2:

Gilbert Gonzales, Murray City Corp., representing Utah Chapter of ICC, requests Approved as Submitted.

Commenter’s Reason: Stack effect is a reality in high rise buildings. Migration of smoke in these structures is a factor which should not be ignored. A smoke control system is the only practical way to manage smoke hazard on upper levels.

Public Comment 3:


The proponent of this public comment has challenged the committee recommendation on both G-51 and G-52 for disapproval. The reasons for the challenge on G-51 are contained in the supporting statement and technical background information on G-52, since they also apply equally to the issue raised in G-51.

Since the supporting statement is lengthy, it has been attached to G-52 since the proposed code text in G-52 is preferred by the proponent.

G52-02

403.3 (new)

Proposed Change as Submitted:

Proponent: Greg Rogers, Kitsap Fire District, No. 7, Washington; representing Washington State Association of Fire Marshals

Add new text as follows:

403.3 Smoke control. A Smoke Control system shall be installed in accordance with section 909.

Renumber following sections.

Proponent’s Reason: In a building fire, the most common hazard to humans is from smoke and toxic gases. Most building-related fire deaths are directly related to these products of combustion. Death often results from oxygen deprivation in the bloodstream, caused by the replacement of oxygen in the blood hemoglobin by carbon monoxide. In addition to the danger of carbon monoxide, many other toxic gases that are present in building fires cause a wide range of...
symptoms, such as headaches, nausea, fatigue, difficult respiration, confusion, and impaired mental functioning.

Smoke, in addition to accompanying toxic and irritant gases, contributes indirectly to a number of deaths. Dense smoke obscures visibility and irritates the eyes and can cause anxiety and emotional shock to building occupants. Consequently, the occupant may not be able to identify escape routes and utilize them.

The high-rise building has natural forces affecting fire and smoke movement that are not normally significant in lower buildings. Stack effect and the impact of winds can be very significant, and very different, in high-rise buildings.

In a high-rise building, the stack effect is increased due to the height of the building. Many high-rise buildings have a significant stack effect, capable of moving large volumes of uncontrolled heat and smoke through the building.

No manual fire-fighting techniques are known to counter stack effect or to mitigate its effect during a fire. Stack effect cannot be eliminated because of the temperature differential and building height. As a result, potential stack effect will exist and may vary with climatic conditions. The only way to mitigate the potential of stack effect is to design and construct the building to minimize the effect. A thorough review of available resources on the subject will enhance design and construction. Basic concepts include:

(a) Airtight compartmentalization from floor to floor and wall to wall. This involves sealing penetrations and exterior building tightness.

(b) Eliminating naturally ventilated shafts and floors that could contribute to stack effect during a fire. One of the most commonly encountered situations is elevator shafts with normally open vents. These designs should be active so that the venting will terminate during a fire, thus reducing the impact of stack effect.

(c) Zone compartmentalization and control of mechanical systems, which could contribute to, or be affected by, stack effect.

Egress and people movement systems within high-rise buildings make them unique. Due to building height, traditional features of life safety, such as means of egress, are limited. It is possible that stairs may slow evacuation and create queuing times.

To mitigate such evacuation issues, other concepts, such as passive and active people movement systems, have evolved. Concepts such as areas of refuge, defend in place, pressurized exits, enclosed/pressurized elevators, increased fire ratings, communication systems, and life support systems all apply when mitigating the egress conditions a high-rise building presents.

I think the Scope and purpose of Section 909 covers it best, by stating "The purpose of this section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide tolerable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of contents, the timely restoration of operations, or for assistance in fire suppression."

Some materials used in reason from Fire Protection Handbook and IBC.

Committee Action: Disapproved

Committee Reason: Based on the action taken on G51-02.

Assembly Action: Approved as Submitted

Motion Failed

Individual Consideration Agenda:

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter’s Reason: Certain fires in North America during the past 40 years have demonstrated that serious fires can occur in modern high-rise buildings, that these fires can generate tremendous quantities of smoke, and that smoke can spread rapidly throughout these buildings.

Automatic sprinkler systems have a good track record in controlling fire, and for that reason are being installed in all types of high-rise buildings. However, in the fire protection community there are three conflicting opinions regarding smoke development and control in buildings protected by automatic sprinkler systems:

1. Smoke control systems are not needed because fire sprinklers limit fire growth, minimize fire size and limit smoke production to negligible levels.

2. Automatic sprinkler protection actually compliment smoke control systems producing a beneficial effect by reducing air flow rates and pressure differentials needed to achieve effective smoke control.

3. Sprinklers actually worsen smoke conditions (especially in shielded fires) by increasing the amount of smoke produced, causing it to descend to floor level where it reduces visibility.

In reality, all three philosophies contain a measure of validity based on both field experience and computer modeling. Therefore, one opinion cannot be entirely discounted in favor of another. Most experts on high-rise design do agree that no one feature is the panacea to the fire and smoke protection dilemma. History has taught us that a combination of education, automatic sprinklers, provisions to control smoke migration, early detection, and compartmentation provide better protection than any design philosophy that relies on a single system or feature.

The validity of this proposal to require smoke control in high-rise buildings is based on the known science and field experience regarding how smoke is generated in sprinklered fires, how smoke follows the unique air currents that develop in a high-rise building, and most importantly, the height and areas allowances for a high-rise building that would be permitted by the International Building Code (IBC).

The Report on the Public Hearing explained the committee recommendation for disapproval of G51 and G52 by stating, “that no statistics to support this requirement or research data was provided” that would justify the additional “design, construction and maintenance costs”.

It is true that little research has been performed to study the effects of automatic sprinkler protection combined with smoke control systems in high-rises. Most of the work has been conducted on sprinklers alone in order to address questions about the interaction of the sprinkler spray and the fire itself by such groups as Factory Mutual, Hong Kong Polytechnic, NIST, the National Fire Protection Research Foundation, and other research organizations and universities. All of these studies provide important information about the interaction of sprinklers and fire. But they do not immediately apply to the question about how that interaction affects the performance of a smoke control system in a building. Few, if any, high-rise buildings have been constructed to the unique requirements of the IBC that would yield such information, and modeling has not yet been published that incorporates the IBC requirements. Data, at present, is also limited on the performance of sprinklers systems in controlling fire growth and smoke generation from a shielded fire,
even though the probability of a shielded fire is significant. It is, therefore, impossible to provide such specific data as it relates to the IBC requirements in support of the G S1 or G2 proposals.

However, there are over 100 years of significant historical record on the fire and smoke performance of high-rises, and an abundance of easily obtainable scientific information on smoke development and migration available through NIST, NFPA, universities and research organizations that would assist the model code members in making an intelligent projection about how a high-rise constructed to the IBC would perform in the future for protection of property, and most importantly, life safety. Presented here is an elementary and minuscule summary of some of that information that relates to this proposal.

History -

In the first half of this century, high-rise buildings were not viewed as being major contributors to the smoke hazard problems. This can, in part, be attributed to the extensive compartmentation and limited use of flammable wall and ceiling materials in the building at that time. Since the mid-century, however, changes in design, construction, and occupancy practices of buildings have resulted in increased fire loads, and decreased number of compartments in buildings. Fire compartment size has increased with the center core, open-floor concept common in modern buildings. To date, Table 503 in the National Building Code has the most generous heights and areas allowances permitted by any building code in US history without any substantive justification.

Combustible furnishings, insulations, and interior finishes in modern buildings have increased the fire load. For example, it has been estimated that if the smoke from just one burning upholstered armchair with 9 pounds of polyurethane foam were uniformly distributed throughout an 1800 square foot apartment, an occupant’s hand held at arms length would be obscured from his or her own face.

In North America, the fire community became aware of the modern fire problems unique to high-rises due to several disasters. Most notable were the 1970 One New York Plaza fire, the 1973 Hyatt Regency O’Hare Hotel fire, the 1980 MGM Grand Hotel in Las Vegas, a 1981 fire in North York Ontario at the Inn on the Park Hotel, the Regency O’Hare Hotel fire, the 1980 MGM Grand Hotel in Las Vegas, a 1981 fire in North York Ontario at the Inn on the Park Hotel, the 1983 First Canadian Place in Toronto, Ontario, and One Meridian Vegas, a 1981 fire in North York Ontario at the Inn on the Park Hotel, the 1983 First Canadian Place in Toronto, Ontario, and One Meridian Plaza, Philadelphia, Pennsylvania in and the First Interstate Bank in Los Angeles, California in the 1990’s. Other disastrous high-rise fires in the 1970s in Seoul, South Korea, Bogotá, Colombia and Sao Paulo, Brazil drew international attention to the problem.

Smoke problems in high-rises were first addressed in the 1960s by the Institute for Research in Construction (IRC) of the National Research Council of Canada. Early research involved fire studies, evacuation studies, and field measurements of air handling movement in the multi-story buildings caused by stack action and building air-handling systems in 9 to 45 story office buildings.

In the United States, Dr. John Kloe and other researchers from the National Institute of Standards and Technology (NIST) pioneered the research, along with Dr. G. D. Lougheed of the Building and National Fire Laboratory, members of ASHRAE’s TC 5.6 Committee on Fire and Smoke Control, and also the National Fire Protection Association’s Committee on Smoke Management Systems. Other sources of research on fire and smoke issues in high-rise buildings are the Building Research Institute in Japan, the Fire Research Station in Borehamwoods, U.K., and the Centre Scientifique et Technique du Batiment in France. In this respect, researchers and students of the fire sciences are well informed about the dynamics of smoke movement in high-rises. The studies and conclusions of irrefutable facts led to the inclusion of requirements for smoke control and other measures in various building codes and standards worldwide.

Research –

Although volumes have been written on the subject of smoke generation, toxicity and migration, the three most notable field research documents on the subject of smoke control and sprinklers were developed by the 1) Seattle Fire Department in 1984 at the United Pacific Building fire test, 2) actual full-scale field tests conducted by Dr. John Kloe at the Plaza Hotel in Washington DC in 1989, and 3) tests conducted by the National Research Council of Canada National Fire Laboratory (NFL), jointly funded by the American Society of Hearing, Refrigeration and Air Conditioning Engineers, Inc. (ASHRAE) and the National Research Council of Canada in 1991and 1992.

The Seattle study looked at pressures generated by sprinklered and unsprinklered fires, carbon monoxide generated by sprinklered, shielded fires, and the performance of three smoke control approaches – stairwell pressurization, elevator shaft pressurization and zoned smoke control. The Seattle study concluded that sprinklers were effective in reducing fire pressures and thereby improved the likelihood that smoke control systems designed to the current standards (for assumed non-sprinklered conditions) would prevent smoke spread. There was no suggestion that the design standards could be reduced for sprinklered fire conditions. For non-sprinklered fires, the results showed that design pressure differences much higher than required by the Seattle building authority were required to prevent smoke spread into shafts. Problems with loss of stair pressurization upon opening of doors, with subsequent contamination of the elevator shafts were noted. This study provided a useful starting point for further validating studies.

Dr. Kloe studied non-sprinklered fires with smoke control and sprinklered fires without smoke control in a series of full-scale fire tests at the Plaza Hotel. He noted that the fire pressures were low in the sprinklered fires and would not likely pose a challenge for a smoke control system designed to meet current standards. He also noted that sprinklered fires that were not rapidly extinguished could produce significant smoke, and that smoke control would be useful.

The NRC/ASHRAE project was a two-phase study, the first phase being conducted in a 1-story room test, which was intended to provide basic information regarding the interaction of sprinklers and shielded fires. The results were used for the design and interpretation of the second phase of 6 full-scale fire tests on the 7th floor of the NFL 10-story experimental tower. A smoke control system was used that had been designed to NFPA 92A (1988). The fires were shielded from the sprinkler spray so that prolonged smoke production would occur. Both fast response and standard response sprinklers were used. These tests yielded a considerable amount of useful information. The test reports are hundreds of pages in length, but here are some of the key summary points:

Occurrence of Shielded Fires: A sprinkler system designed according to NFPA 13 will almost always extinguish a fire, provided that the conditions at the time of the fire are reasonably close to the conditions in the design. A number of situations can occur where conditions of use of a building can compromise the performance of the sprinkler system. One such situation is where the fuel arrangement is shielded directly from the direct sprinkler spray. Even a "controlled" fire, as defined by NFPA 13, may continue to pose a threat to life safety. If not well ventilated, the smoke will contain dangerously high levels of carbon monoxide. Because the windows may not break due to the cooling effect of the sprinklers, the fuel itself may be densely packed so that it cannot burn in a freely ventilated manner. Therefore, shielded fires should be anticipated because they have a high probability of occurrence.

Smoke production and toxicity: The tests showed that shielded, sprinklered fires produce large volumes of toxic smoke, which will spread through a tall building if no measures are taken to stop it. In a later report, shielded fires with only two operating sprinklers, the heat release rate, radiant flux, room temperature and buoyancy
pressure were substantially reduced in a compartment. However, even though the total smoke production was reduced by the sprinklers (and was notably less than in a non-sprinklered fire), there were significant quantities of “cold” smoke produced, and that this smoke contained potentially harmful concentration of carbon monoxide.

The NRC/ASHRAE report made a number of recommendations as to how smoke control systems are to be designed, including stairwell pressurization, and subjects for future studies.

Science-

Smoke flow is a complex process resulting most often in upward movement. However, the movement of smoke through a building follows the same flow patterns and currents as the air inside the building which can result in horizontal and even downward flow. The two natural forces responsible for air movement patterns in a high-rise building are 1) wind action and 2) stack action. The two mechanical systems that also cause air movement are 3) the piston effect of elevator cars and 4) the HVAC system. In addition to these forces, other factors during a fire can also contribute to smoke movement, such as, buoyancy of combustion gases, expansion of gases and forced ventilation.

Wind exerts pressures on buildings that impose structural load of particular concern for high-rise buildings. The pressure from wind can also lead to air leakage and air movement within a building, which is major consideration in heating, cooling and in the movement of smoke. Although useful for natural ventilation, wind pressures can adversely affect air-handling equipment such as fan inlets and outlets during normal operations or especially during a fire event. Something as simple as a window opened or broken on the windward side of a building can force smoke to other locations in a building.

Stack action is an upward flow of air caused by the difference between the indoor and outdoor air temperature. It causes air to flow into a building from outdoors at low levels, upward through openings in the floors and vertical shafts, and out upper levels. This phenomenon usually occurs in colder climates during winter. However, reverse stack effect can also take place when the temperature on the inside of the building is colder than the outside temperatures due to air conditioning, commonly occurring in hotter climates.

Although fire resistive compartments are designed and constructed to prevent the spread of fire, they are not airtight. Such compartments can contain numerous cracks and openings around doors, windows, unprotected or improperly protected pipes, undampened ducts, as well as other types of openings such as shafts, stairwells, etc. According to Dr. George Tamura in his book, “Smoke Movement and Control in High-Rise Buildings”, even in one and two story buildings, the stack effect in winter is sufficient to affect certain aspects of air leakage significantly. In very tall buildings, the stack effect can lead to pressure differences as great as 250 Pa (1 inch of water) across exterior walls.

When an elevator car is in motion, suction pressure is created behind the moving car by piston action inside the shaft. As the car moves past the fire floor, this suction pressure can induce smoke form the fire region to enter the elevator shaft unless measures are taken to prevent it.

Heating, ventilating, and air conditioning (HVAC) systems are necessary to condition and distribute air through a network of ducts that interconnect many compartments one to another that would otherwise not be connected. In the event of a fire, the HVAC system can inadvertently serve to move the smoke far beyond the area of origin, contaminating areas of a building that are not involved with the fire. Presently, the IBC contains provisions for automatic fan shutdown upon detection of smoke, fire and smoke dampers are required in fire-resistance rated shaft enclosures, and fire dampers are only required in two hour-rated fire barriers (and one-hour where the property is not protected with automatic sprinklers). By some undefined standard, that may be satisfactory smoke protection for lower buildings where people can more easily evacuate from a building if the need arises. Air and smoke flow network models studies indicate that, with the air handling systems shut down, even relatively “leaky” dampers are of great benefit in reducing vertical smoke movement. However, HVAC systems can be designed to change modes of operation to achieve smoke control in specific zones of a building during fire situations, and this is the more appropriate, engineered smoke protection for high-rise buildings, which is the type of engineered smoke control system proposed in G51 and G52.

All these factors can combine to exert various pressures on the interior floors and walls and the exterior walls. Open floor plans tend to have the greater pressures throughout entire floor to next floor above due to stack effect. Under normal conditions compartmented floors tend to have different pressures in each compartment, with such pressures being separated by interior barriers. In a fire situation, the pressures can be greatly increased, particularly in the fire compartment. The large compartments permitted in the IBC with fewer separation walls than ever before have caused concern among some in the engineering community that the current successful fire record of life safety in high-rise offices cannot be maintained even with automatic sprinklers. Tests have indicated that the smoke hazard in an office building or other building uses with open floor plans in a high-rises are potentially the most hazardous for smoke migration due to pressures and air flow patterns, particularly in the upper floors. Apartment buildings, buildings with more compartmentation are more inherently resistant to smoke movement. However, the number of fatalities in high-rise apartments indicates that smoke can spread even in compartmented buildings to endanger the lives of people remaining in their rooms, or attempting to escape in corridors and stairwells. Therefore, similar attention to smoke control must be applied to residential occupations.

Egress and Fire Fighting-

There are two basic procedures in evacuating a multi-story building: Uncontrolled total evacuation, and controlled selective evacuation, the second usually being controlled by building management. Anticipating the duration and method of the evacuation is important since it has an important implication on the smoke control system. Possible congestion at a stairwell entrance, causing queuing up at the stairs can leave the doors open for prolonged period of time leaving the stairwells untenable. Additionally, fire fighters must use the stairwells to ascend to the fire area. Fire fighting, search and rescue operations, together with evacuation of occupants involve the stairwells and elevator doors, which can create multiple openings in the walls of the fire area.

In light of all these well-established facts, the 2000 International Building Code does not have a high-rise requirement for engineered smoke control system. Why not? It cannot be because history and science do not support it. Interestingly, the three model code building groups voted overwhelmingly to disapprove three proposals in 2000 code development cycle from the Oregon Building Officials Association that would have eliminated the current requirement for smoke control systems in atria, underground buildings, and covered malls. (See G50-00, G64-00 and G65-00). The proposal seemed to be prepared by the proponent as a sort of “trial balloon” submitted in response to a conspicuous absence of a similar high-rise provision as surmised from the supporting statements. It is obvious from this resounding “disapproval” vote that the voting members recognized the value of engineered smoke control systems in sprinklered construction. Perhaps the simple reason that there is no smoke control provision in high-rises in the IBC is because the voting membership has not yet been presented with the opportunity to vote for it — until now.

SUMMARY: High-rise buildings constructed to the requirements of International Building Code, but without any specific measures to control smoke migration, are all the more vulnerable to property damage and occupants’ loss of life. In reality, all the available
research indicates that the need for smoke control is more pressing in tall buildings that in any other type of construction.

The following sources were used for reference in the preparation of this public comment:

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Improving Sprinkler System Performance.

Huo, R.; Liu, B.

Klote, J. H.
Fire Experiments of Zoned Smoke Control at the Plaza Hotel in Washington, DC. ASHRAE Transactions, 1990

Klote, J. H. and Milke, J. A.

Klote, J. H.
Compartmentation and Dampers are Essential for Life Safety, Southern Building, Southern Building Code Congress, Inc. Birmingham, AL, March/April 1999

Klote, J. H. and Milke, J. A.
Principles of Smoke Management, ASHRAE and Society of Fire Protection Engineers. 2002

Lougeed, G. D.; Carpenter, D. W.; Ouellette, M. J.

Morgan, H. P.; Hansell, G.
Fire Sizes and Sprinkler Effectiveness in Office: Implications for Smoke Control Design.

Mulholland, G.W
Smoke Production Properties, SFPE Handbook of Fire Protection Engineering, NFPA, Quincy, MA 1995

Narayanan, P.
Smoke Safety in Atrium Buildings.

National Research Council of Canada and ASHRAE Report

National Research Council of Canada and ASHRAE Report

Seattle Fire Department

Tamura, G. T.

Tamura, G. T.
Smoke Movement and Control in High-Rise Buildings,

G58-02
403.9.1(new); 1003.2.13.3

Proposed Change as Submitted:

Proponent: Hassan Alameddine, Los Angeles Basin Chapter of ICBO

1. Add new text as follows:

403.9.1 Elevator lobby. Elevators on all floors shall open into elevator lobbies that are separated from the remainder of the building, including corridors and other means of egress, by smoke partitions complying with Section 710. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within the code. Elevator lobbies separated from a fire resistance rated corridor shall have walls of not less than one-hour fire resistance rating and openings shall conform to Section 714.

Exceptions:
1. Separations are not required from a street floor elevator lobby.
2. In atria complying with the provisions of Section 404 elevator lobbies are not required.

2. Revise as follows:

1003.2.13.3 Elevators. An elevator to be considered part of an accessible means of egress shall comply with the emergency operation and signaling devices requirements of Section 211 of ASME A17.1. Standby power shall be provided in accordance with Sections 2702 and 3003. The elevator shall be accessed from either an area of refuge complying with Section 1003.2.13.5 or a horizontal exit.

Exceptions:
1. (No change)
2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Proponent’s Reason: The elimination of elevator lobbies in the 2000 IBC is tied to the requirement for fire-resistive construction in corridors. Since all high rise buildings are required to be sprinklered, and since corridors in fully sprinklered office buildings are not required to be fire-resistive, there is no requirement for elevator lobby separation. This proposal would require elevator lobbies in high rise buildings to be separated from the rest of the building, but it would
not require that the separation be fire-resistive, just that it be capable of resisting the passage of smoke.

Because smoke is the major threat in all fires, particularly in fires in multistory buildings, protection of vertical openings is vital to the welfare and safety of building occupants; and since elevator shafts are generally the largest vertical shafts in most buildings, protecting those shafts by enclosing elevator lobbies is critical.

These lobbies not only provide barriers that can prevent the migration of smoke throughout the building, but can also serve as safe areas of refuge for those fleeing the initial stages of a fire, afford safe haven for people incapable of using the exit stairs to evacuate the fire floor, maintain a clean elevator shaft for more efficient and effective fire department operations, and provide protected staging areas for fire fighters in fighting the fire.

This proposal is similar in content to a change presented at the 1999 (O140-99) hearings in Costa Mesa, California. The Committee asked the proponents to specifically address the development of a performance criteria for “smoke partitions” which was accomplished in the 2001 code change cycle by code change FS18-01 which added new Section 710 to the code.

Committee Action: Disapproved

Committee Reason: The proposed text does not indicate the type of fire resistance rated assembly to be used in constructing elevator lobbies which makes it difficult to determine construction and opening protective requirements. Several uses for elevator lobbies are offered in the reason statement, however no size requirements for the lobby are included which could adversely affect intended lobby uses. Moreover, a recent NIST report took a position against using elevator lobbies as an area of safety for persons not able to use the exit stairs. The term “street floor” is not adequately defined and it is unclear how that term would be properly applied to a building built on a sloped site.

Assembly Action: Approved as Submitted Motion-Failed


Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Evans, Salt Lake City, UT, representing, Utah Chapter of ICC, requests Approved as Submitted.

Commenter’s Reason: The elimination of elevator lobbies in the 2000 IBC is tied to the requirement for fire-resistive construction in corridors. Since all high rise buildings are required to be sprinklered, and since corridors in fully sprinklered office buildings are not required to be fire-resistive, there is no requirement for elevator lobby separation. This proposal would require elevator lobbies in high rise buildings to be separated from the rest of the building, but it would not require that the separation be fire-resistive, just that it be capable of resisting the passage of smoke.

Because smoke is the major threat in all fires, particularly in fires in multistory buildings, protection of vertical openings is vital to the welfare and safety of building occupants. Every reliable study on smoke migration between floors shows elevator shafts to be the largest source. Since elevator shafts are the largest vertical shafts in most buildings, protecting those shafts by enclosing elevators lobbies is critical.

G59-02

404.1.1

Proposed Change as Submitted:

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

404.1.1 (Supp) Definition. The following word and term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

ATRIUM. An opening connecting two or more floor levels other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall. Floors levels, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with Section 505.

Proponent’s Reason: The term “floor levels” is confusing. The change makes it clear that the opening is through the floor. Although balconies and mezzanines are specifically excluded it is still unclear as to whether the floor level is referring to the floor system or the story. Openings go through something. Otherwise the text should address stories which “communicate” or “connect”. Since the definition uses the term “through”, the proposal is the simplest way to fix the wording.

Committee Action: Approved as Modified

Modify proposal as follows:

ATRIUM. An opening connecting two or more floor levels other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall. Floors levels, as used in this definition, do not include balconies within assembly groups or mezzanines that comply with Section 505.

Committee Reason: Based on the proponent’s published reason and his agreement that the modification better expresses his intent.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:
G61-02 404.5

Proposed Change as Submitted:


Revise as follows:

404.5 (Supp) Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier wall.

1. and 2. (No change to current text)

3. A glass wall forming a smoke partition and having an minimum 20-minute fire protection rating when tested in accordance with Section 714.3.1.

4. 3–The adjacent spaces of any three floors of the atrium shall not be required to be separated from the atrium where such spaces are included in computing the atrium volume for the design of the smoke control system.

Proponent’s Reason: This code change proposes the use of a wall, constructed of 20-minute fire protection rated glazing tested under positive pressure in accordance with NFPA 257, including hose stream, for the separation of an atrium. The use of a conventional fire tested glazing system may provide more reliable separation of the atrium than those walls currently allowed. A wall consisting of 20 minute fire protection rated glazing will remain in place for the time required for conventional automatic sprinklers to operate and is expected to remain in place under thermal shock. There would be no need for special sprinklers for such an installation.

Atrium separation walls of ordinary glass require complex designs involving gasketed frames and specially designed sprinkler systems. Additionally, one has to be concerned about obstructions to the sprinkler flow from curtains or wall frame members. The proposed revision provides a simple solution to the atrium separation requirement.

A similar revision was submitted in the 2001 revision cycle. Committee members expressed support for the concept, but had questions regarding the wording of the proposal. The proposed revision has been editorially revised to make the intent and application clear.

Committee Action: Approved as Submitted

Committee Reason: Based on the proponent’s published reason.

Assembly Action: Disapproved-Motion Failed

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Ronald W. Clements, Jr., Chesterfield County, representing Virginia Building and Code Officials Association, requests Disapproved.

Commenter’s Reason: When the atrium provisions were first introduced many years ago, they required that the atrium be separated from contiguous spaces with a one-hour fire barrier. At the same time, the exception (Exception #1 of 2002 Supp.) permitting the glass wall was included since it was deemed equivalent to the one-hour barrier.

Now the proponent is suggesting in his supporting statement that the glass wall may not perform any better than 20-minute fire protection rated glazing. However, instead of proposing that the glass wall system be deleted, he is asserting that 20-minute fire protection rated glazing will provide protection comparable to the glass wall. The base requirement that needs to be used for determining equivalency is the one-hour wall.

A similar change proposal submitted to the NFPA 101 Life Safety Code was rejected by the Technical Committee on Fire Protection Features because the proponent failed to show that 20-minute glazing will provide protection equal to the one hour wall.

Public Comment 2:

Stephen V. Skalko, P.E., Portland Cement Association, requests Disapproved.

Commenter’s Reason: Atriums within a building are nothing more than a vertical shaft with large areas. Consistent with other code provisions for vertical shafts in buildings, the code requires the walls enclosing the atrium from the remainder of the building to be one hour rated. There are three exceptions to the one-hour fire rating requirement. One, if glazed assemblies in gasketed frames are provided with closely spaced sprinkler protection. Two, if the wall is constructed of glass block with a 3/4-hour fire protection rating and does not exceed the area limitations for glass block wall assemblies in Section 2110 of the code. And three, if the walls only separate out adjacent spaces on three floors and the spaces are included as part of the atrium volume considered for required smoke removal systems. In all three cases, the code permits the exception because other fire safety provisions are required to offset the one-hour fire rated wall.

This proposal will permit a wired glass assembly with a 20 minute fire resistance rating and tested to positive pressure per 714.3.1 to be substituted for the one hour fire rated wall. That is inconsistent with the provisions of the code. The other three exceptions have additional firesafety requirements imposed before the substitution for one hour wall assemblies is permitted. This proposal does not impose any significant additional firesafety requirements to justify the substitution. In fact it is more lenient than that permitted for glass block wall assemblies. Those assemblies have to meet a 3/4-hour fire rating AND individual panels are limited in size by Section 2110. These proposed wired glass assemblies are only required to meet a twenty minute test rating and be tested under positive pressure. Also, there are no size limitations for the proposed wired glass
assembly panels. Furthermore, typical fire protection rated glazing is required to be at least 3/4-hour fire rated per Section 714.3. In addition, Section 714.3.6.2 of the code normally limits the total area of interior fire window assemblies to no more than 25% of the common wall of any room. Without limitations these wired glass assemblies can easily exceed that size limitation. These proposed wired glass assembly provisions for atriums are not consistent with the other provisions of the code for fire protection rated glazing. Finally, Section 104.11 of the code permits the use of alternate materials and methods. Special conditions in atriums where wired glass panels can be shown to be equivalent to the one hour rated wall assembly can be submitted on a case by case basis. That will enable the code official to make decisions on equivalency when all the circumstances of the installation are considered.

G64-02
406.1.4; IRC R309.1

Proposed Change as Submitted:

Proponent: Ronald E. Estepp, C.B.O., Construction Official, Hillsborough Township, New Jersey

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. Revise as follows:

**IBC 406.1.4 (Supp) Separation.** Separations shall comply with the following:

1. The private garage shall be separated from the dwelling unit and its attic area by means of a minimum 1/2-inch (12.7 mm) gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8-inch Type X gypsum board or equivalent. Door openings between a private garage and the dwelling unit shall be equipped with either self-closing and self-latching solid wood doors, or solid or honeycomb core steel doors not less than 1-3/8 inches (34.9 mm) thick, or doors in compliance with Section 714.2.3. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted.

2. and 3. (No change to current text)

2. Add new text as follows:

**IRC R309.1 Opening protection.** Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with self-closing and self-latching solid wood doors not less than 1-3/8 inch (35 mm) in thickness, solid or honeycomb core steel doors not less than 1-3/8 inches (35 mm) thick, or 20-minute fire-rated doors.

Proponent’s Reason: The purpose of this proposal is to provide a self-closing and self-latching mechanism for any doors that separate the garage from living space. The reason for this proposal is a practical one; during the last 12 months, my jurisdiction has had three fires that started in attached garages. During the each fire an adult investigated the smell of burning, opened the door between the garage and living space and did not close the door hard enough to latch and ran to gather the children in the house to evacuate. Before the Fire Service could arrive on the scene, the fire had spread from the garage to involve the entire 1st floor and ½ of the second floor. In all three cases, the buildings were a total loss. In all three cases, the adults knew exactly where the children were. If the adults were required to search longer than 5 minutes for any of the children, the likelihood of injuries or fatalities would have been great. This proposal would require a self-closing device capable of causing the door to latch, containing the fire in the garage for the 20 minutes that the door is designed, giving the occupants time to detect a problem, search, gather and remove the occupants from the building.

The proposal will increase the cost of construction by less than $2.50.

**ITEM 1 (IBC)**
Committee Action: Disapproved

Committee Reason: Doors between garages and dwellings are usually kept closed to keep out insects, fumes, intruders, etc. Installation of door closers would be a substantial cost impact and the presence of a closer could endanger children who might get their hands caught in the door. The proposed change is also unclear as to whether the self-closing/latching requirement applies only to solid wood doors or all doors. There is inadequate data to support this change.

Assembly Action: No Motion

**ITEM 2 (IRC)**
Committee Action: Disapproved

Committee Reason: This proposal is overly restrictive and could be dangerous in certain scenarios.

Assembly Action: No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Thomas Meyers, City and County of Broomfield, CO, representing Colorado Chapter of ICC, requests Approved as Submitted for Items 1 and 2.

Commenter’s Reason: This change would require self-closing doors between a garage and a house. The Committee disapproved the change stating that, “these doors are USUALLY kept closed ...” If the Code requires a self-closing door, then this door will be
assured of ALWAYS being closed and afford the required protection between the house and garage. The cost difference between a pair of regular hinges and self-closing hinges is just $18 more which does not seem to be a "substantial cost difference" – at least based on the substantial costs we usually see for interior finishes even in moderately priced homes. The Committee felt that the presence of a closer could endanger children who might get their hands caught in the door. To be consistent with this reasoning, we should outlaw the use of closers on front and back screen/storm doors also. We have required self-closers on garage-to-house doors in the western states for many years and I have yet to hear a complaint about an injury related to their use.

This Code Change is an inexpensive and easy solution for providing the minimum separation between the house and garage. Please overturn the Committee decision and approve as submitted.

Analysis: The following combinations of action would achieve technical consistency between the IBC and the IRC.

| Item 1 AS | Item 2 AS | or | Item 2 D | Item 2 D |

G77-02
410.2; 410.3.1.1 (new)

Proposed Change as Submitted:

Proponent: Gregory J. Cahanin, Cahanin Fire Code Consulting; representing Thermotex Industries

1. Revise as follows:

410.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

STAGE. A space within a building utilized for entertainment or presentations wherein scenery is retractable mechanically, either horizontally or vertically, or suspended overhead. Stage area shall be measured to include the entire performance area and adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. Stage height shall be measured from the lowest point on the stage floor to the highest point of the roof or floor deck above the stage. Stages shall be classified as Proscenium, Thrust, Legitimate, Regular, or any of several other terms used historically to describe a particular form of raised platform.

2. Add new text as follows:

410.3.1.1 Stage Area. Stage areas shall be measured to include the entire performance area and adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. Stage height shall be measured from the lowest point on the stage floor to the highest point of the roof or floor deck above the stage.

Proponent’s Reason: Stage height is not pertinent to the definition of a stage. The added language better defines a stage as applied in the design and construction requirements of the building code where permanently affixed equipment includes a fly gallery and gridiron. The listing of different types of stages is added to the definition to indicate that various forms that exist. Legitimate, Regular, and Platform stage definitions were included in the UBC (Chapter 28, Section 3901, 1988 edition).

A new subsection to Stage Construction is added to include the dimensional considerations for stages used elsewhere in 410 and referenced in 410.3.

Note: The committee voted to split the question and acted upon each item separately, with the following results:

ITEM 1
Committee Action: Disapproved

Committee Reason: The terms ‘scenery’ and ‘retractable’ are not defined and could lead to nonuniform enforcement of the provisions by mis-classifying certain non-stage areas as stages. The proposed reintroduction of different classifications of stages (which were removed in response to the 1992 BCMC Stages Report) adds nothing to the code since the terms are not used in the code. This proposed item would reduce the level of protection for stages by eliminating areas that would not have retractable scenery but could have unlimited amounts of non-retractable scenery from the definition. The BCMC Report correctly asserted that stage height is the best predictor of the potential hazard of stages based on fire load. Proposed code change G78-02 is preferred.

Assembly Action: No Motion

ITEM 2
Committee Action: Approved as Modified

Modify the proposed item as follows:

410.3.1.1 Stage height and area. Stage areas shall be measured to include the entire performance area and adjacent backstage and support areas not separated from the performance area by fire-resistance-rated construction. Stage height shall be measured from the lowest point on the stage floor to the highest point of the roof or floor deck above the stage.

Committee Reason: Relocation of prescriptive technical requirements from the definition to a separate section of text is appropriate and consistent with code style. The modification correlates the section title with the content of the new section.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter’s Reason:
A. The first sentence of the Committee Reason should more appropriately read: “The term ‘retractable’ is not defined.” Action on G78-02 accomplished the changes desired in Item 1 of G77-02 by the original proponent to better define Stage. The Committee Reason is however, in conflict with the action on G78-02. The term ‘scenery’ is used in the G78-02 revision without qualification. Further, the term ‘scenery’ is the title of 410.3.6 in which the flammability of scenery is regulated. To state that its use is not appropriate would taint the action on G78-02.

B. The next to last sentence of the Committee Reason should be deleted. The committee reason and commentary that would be developed from it should not include a misinterpretation of the 1992 BCMC report when it is readily available.

a. The report’s 5.1.1 stated, “All portions of a stage area with a stage height greater than 50 feet shall be within an areas separated from all other building areas by 2 hour fire resistance rated construction with protected openings except that the main opening in the proscenium wall used for viewing performances shall be provided with prosenium opening protection. The 2 hour fire resistance rated construction shall extend to the roof or floor deck above the auditorium.”

b. The discussion portion of the report qualifies that the BCMC established the facilities in concept, that is to say the report presented a general idea or understanding, not necessarily an absolute condition.

c. The BCMC commentary in defining what was then commonly called ‘regular stages’ established the qualifier of 1,000 square feet or less in stage area and a height of 50 feet or less for the stage. The “legitimate” stage definition was applied to stages of more than 50 feet in height and greater than 1,000 feet in area when the “regular stage” definition is used to bracket area requirements. The BCMC comment on the conceptual 5.1.1 states “Rather than use a term (legitimate stage) to define the stage of concern, the characteristics of a stage are identified with the resulting required protection.”

d. Nowhere in the BCMC report is there an assertion that stage height is the best predictor of the potential hazard of stages based upon fire load as the Committee Reason incorrectly states.

Deletion of the next to last sentence of the Committee Reason and commentary that reflect an improvement in the stage definition with G77-02. Item 2 and G78-02 is more appropriate to the desire to better define performing stage requirements.

G80-02
410.3.4; 410.3.4.1 (new)

Proposed Change as Submitted:

Proponent: Gregory J. Cahanin, Cahanin Fire Code Consulting; representing Thermotex Industries

1. Revise as follows:

410.3.4 Proscenium wall. Where the stage contains combustible hangings other than a single main curtain, borders, legs and a single backdrop, height is greater than 50 feet (15 240 mm), all portions of the portion of the stage containing the gridiron for flying scenery shall be completely separated from the assembly seating area by a proscenium wall with not less than a 2-hour fire-resistance rating extending continuously from the foundation to the roof.

2. Add new text as follows:

410.3.4.1 Separations. A proscenium wall shall also be provided to separate the stage from the assembly seating area when:

1. The stage height above the top of the valence opening is more than 5 feet (1524 mm),

2. Fixed audience seating is provided for more than 300 occupants, or

3. The fuel load for the stage when in operation including setups upon the stage and flying scenery is determined to be 12.5 lb./ft² (20.23Kg/m²).

Proponent’s Reason: This change significantly changes the application of prosenium wall requirements from an arbitrary 50-foot height to an application that recognizes fuel loading of the stage as it relates to the need for a fire barrier wall. Deletion of “all portions of the” stage is needed since the stage floor area may include a portion of the stage beyond the prosenium wall and may include a thrust stage that could not be protected with a prosenium wall.

The limits on the combustibility of a single main curtain, borders, legs, and a single backdrop are taken from 410.6.2 that excludes automatic sprinklers from stages, which are most likely to be constructed in elementary schools or small stages where the hazard of flying scenery stored above a stage does not typically exist. There is no evidence that stages with ceilings less than 50 feet in height, having gridirons for hanging flying scenery, will not be subjected to a severe fire that would create a glow that could be seen from the assembly seating area as detailed in 410.3.5 for a period of up to 20 minutes.

The existing 50-foot stage height qualifier for prosenium walls should be removed for several substantial reasons.

In the mid to late 90’s, the model codes moved to redefine stages based solely upon stage height based upon a BCMC report. The 1992 BCMC public hearings report in establishing a facilities concept is fraught with terms, which are not definitive such as “is expected” and “does not readily permit” in attempts to define the full working stage and a regular stage. While abandoning barrier protection for all stages under fifty feet, the BCMC stated, without specific data referencing sprinklers and stages that “suppression systems are proven very effective in this limited height situation” (page 5-C). It is likely the BCMC is referencing sprinkler performance for areas other than stages and without the inherent audience risk.

Confusingly, the effective sprinkler performance at heights greater than 50 feet does not carry over to stages under 50 feet in the BCMC report. The report states, “The height may reduce the effectiveness of suppression systems and the multiple settings hung over the stage may further obstruct the suppression systems and impede access to a fire originating high above the stage.” Stages to 50 feet in height can have similar fuel loads from hanging scenery and many stages are now being constructed to 49 feet to avoid the prosenium requirement while being able to store significant quantities of flying scenery above newly constructed stages.

BCMC correctly notes that “using a water curtain in lieu of a fire curtain places reliance on the smoke control or roof vents to control smoke movement. "Logic dictates that if flying scenery could reduce the effectiveness of suppression systems that are heat activated, roof vents would be similarly impacted. It is well established that heat transfer in a fire is via convection and radiation. Water curtains do not block radiation from a fire and make up 30 to 40% of the heat energy of a fire. Solely relying upon water based protection measures on a legitimate stage would therefore not be consistent with use and occupancy mandates in Chapter 4 of the building code.

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Data provided by the NFPA Fire Analysis & Research Division as a part of the BCMC action was updated in July 2001 that provides some definitive insight into fires in theaters over a 19-year period. Annualized data of the report indicates there was one structural fire every four days in legitimate theaters with fixed seats. Approximately 8% of those fires were occurring in the performance or stage areas.

The height of the proscenium or valence opening in relation to the ceiling height is a critical factor in requirement for a rated proscenium wall between the stage and the audience. Moderate fuel loads of as little as 12.5 lb/ft² (taken from the NFPA Fire Protection Handbook) require separation of the stage for both people and property protection.

Current establishing of protection measures for stages based upon stage height is not consistent with the need to provide a high level of fire safety in assembly occupancies with stages. The SFPE guide states that in order to manage the fire the system must control the combustion process (fuel & environment), suppress the fire (sprinklers) and control fire by construction (barriers). Current requirements for stages under 50 feet lack criteria and systems to control fire by construction. The SFPE guide states that in order to control fire movement the fire must be vented and the fire must be contained. A lack of a proscenium barrier and protection for stages under 50 feet is a significant omission in current stage requirements. The proposed changes for proscenium wall requirements will provide for redundancy in protection where large numbers of occupants will be at risk in a fire.

Committee Action: Disapproved

Committee Reason: The current text provides unambiguous thresholds for the requirements whereas the proposed text’s thresholds would be difficult to quantify and enforce. There is insufficient supporting data for including the components of item 2 of the proposed change. The proposal has not made the case for overturning the five year, comprehensive study of stages done by the BCMC which resulted in the current text.

Assembly Action: Approved as Submitted

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Gregory J. Cahanin, Cahanin Fire Code Consulting, requests Approved as Modified by this comment for Item 1.

Modify proposal as follows:

410.3.4 Proscenium wall. Where the stage contains combustible hangings other than a single main curtain, borders, legs and a single backdrop, the portion area of the stage containing the gridiron for flying scenery shall be completely separated from the assembly seating area by a proscenium wall with not less than a 2-hour fire-resistance rating extending continuously from the foundation to the roof.

Commenter’s Reason: This change significantly changes the application of proscenium wall requirements from an arbitrary 50-foot height to an application that recognizes fuel loading of the stage as it relates to the need for a fire barrier wall. Deletion of “all portions of the” stage is needed since the stage floor area may include a portion of the stage beyond the proscenium wall and may include a thrust stage that could not be protected with a proscenium wall. The new 410.3.1.1 Stage height and area section approved at the Pittsburgh meeting will bring consistency to the revisions proposed here as well.

The limits on the combustible hangings consisting of a single main curtain, borders, legs, and a single backdrop are taken from 410.6-2 that excludes automatic sprinklers from stages, which are most likely to be constructed in elementary schools or small stages where the hazard of flying scenery stored above a stage does not typically exist. The combustible hanging limits language is also consistent with new 410.2 Stage definition changes approved in Pittsburgh.

This change significantly changes the application of proscenium wall requirements from an arbitrary 50-foot height to an application that recognizes fuel loading of the stage as it relates to the need for a fire barrier wall. Deletion of “all portions of the” stage is needed since the stage floor area may include a portion of the stage beyond the proscenium wall and may include a thrust stage that could not be protected with a proscenium wall.

The limits on the combustibility of a single main curtain, borders, legs, and a single backdrop are taken from 410.6-2 that excludes automatic sprinklers from stages, which are most likely to be constructed in elementary schools or small stages where the hazard of flying scenery stored above a stage does not normally exist.

The existing 50-foot stage height qualifier for proscenium walls should be removed for several substantial reasons. In the mid to late 90’s, the model codes moved to redefine stages based solely upon stage height based upon a BCMC report. The 1992 BCMC public hearings report in attempting to define the full working stage and a regular stage established parameters for the “regular stage” of a height of less than 50 feet and an area of 1000 feet or less. For the IBC stages less than 50 feet are not limited in area. A stage design under current requirements of stage height only can have an unlimited stage area and thus a volume equal to or larger than a stage with a height above 50 without the additional protection higher fuel loads should require to protect property and people.

In the first edition of the NFPA Life Safety Code Handbook (1976) commentary noted correctly that modern stages pose problems, which didn’t exist in the past. Scenery would be shifted horizontally, vertically, or both ways and the use of thrust stages and areas stages created additional fire safety concerns. The provisions for fire curtains separating stages from the audience remained the same until the BCMC report was issued in 1992. The commentary on a change in stage use in 1976 is still relevant today. Stages large in area are being constructed to heights of 49 feet with the larger wings being designed to hold the scenery that once was lifted above the stage.

Fire protection based solely upon stage height will allow for reductions in fire protection due to a lack of an area qualifier when the potential for fire is great. The area qualifier as stated in the 1992 BCMC commentary were not included in the original provisions of the IBC. The change in language here will result in a threshold for stage protection beyond the elementary and high schools using a single main curtain, borders, legs, and a single backdrop that now serve as a sprinkler qualifier in 410.6-2. Enforcement of stage sprinkler requirements is effective with this language; the inclusion of proscenium wall protection will also be consistent with this change.

Public Comment 2:

Gregory J. Cahanin, Cahanin Fire Code Consulting, requests Approved as Modified by this comment
for Item 2.

Modify proposal as follows:

410.3.4.1 Separations. A proscenium wall shall also be provided to separate the assembly seating area when the fuel load for the stage from the assembly seating area when:

1. The stage height above the top of the valence opening is more than 5 feet (1524 mm).
2. Fixed audience seating is provided for more than 300 occupants, or
3. The fuel load for the stage in operation including setups upon the stage and flying scenery is determined to be 12.5 lb/ft² (20.23Kg/m²).

Commenter’s Reason: This modification to the original proposal establishes a fuel load threshold wherein redundant protection is required in the form of a proscenium wall with fire curtain to complement the roof vents and automatic sprinklers that are required elsewhere. There are several justifications for this change.

1. In the mid to late 90’s, the model codes moved to redefine stages based solely upon stage height based upon a BCMC report. The 1992 BCMC public hearings report in establishing a facilities concept is fraught with terms, which are not definitive such as “is expected” and “does not readily permit” in attempts to define the full working stage and a regular stage. While abandoning barrier protection for all stages under a fifty feet, the BCMC stated, without specific data referencing sprinklers and stages that “suppression systems are proven very effective in this limited height situation” (page 5-C). It is likely the BCMC is referencing sprinkler performance for areas other than stages and without the inherent audience risk.

Confusingly, the effective sprinkler performance at heights greater than 50 feet does not carry over to stages under 50 feet in the BCMC report. The report states, “The height may reduce the effectiveness of suppression systems and the multiple settings hung over the stage may further obstruct the suppression systems and impede access to a fire originating high above the stage.” In this case the performance of a barrier with fire curtain was considered necessary. Stages under 50 feet in height can have similar fuel loads from hanging scenery and many stages are now being constructed to 49 feet to avoid the proscenium requirement while continuing to store significant quantities of flying scenery above newly constructed stages.

BCMC correctly notes that “using a water curtain in lieu of a fire curtain places reliance on the smoke control or roof vents to control smoke movement.” Logic dictates that if flying scenery could reduce the effectiveness of suppression systems that are heat actuated, roof vents would be similarly impacted. It is well established that heat transfer in a fire is via convection and radiation. Water curtains do not block radiation from a fire and make up 30 to 40% of the heat energy of a fire. Solely relying upon water based protection measures on a legitimate stage would therefore not be consistent with use and occupancy mandates in Chapter 4 of the building code.

2. Data provided by the NFPA Fire Analysis & Research Division as a part of the BCMC action was updated in July 2001 that provides some definitive insight into fires in theatres over a 19-year period. Annualized data of the report indicates there was one structural fire every four days in legitimate theaters with fixed seats. Approximately 8% of those fires were occurring in the performance or stage areas. Fire protection in the form of sprinklers, vents, and barriers are needed in larger theatres with the two-box arrangement of stage and audience.

3. Moderate fuel loads of as little as 12.5 lb/ft² (taken from the NFPA Fire Protection Handbook data) should require separation of the stage for both people and property protection. The city of Phoenix recently constructed a multi-use assembly facility with a large theatre. In deciding upon the type and level of fire protection measures to be taken two design fires were used to determine control measures- based upon 5,000 BTU/sec and 10,000 BTU/sec heat release rates. These axisymmetric plume calculations are prescribed in UBC 905.2.2. This proposal uses a fuel load factor expressed in pounds per square foot rather than BTU/sec that requires the designer to determine what is likely to go into the building once it is completed.

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G82-02 410.3.5

Proposed Change as Submitted:

Proponent: Gregory J. Cahanin, Cahanin Fire Code Consulting; representing Thermotex Industries

Revise as follows:

410.3.5 Proscenium curtain. The proscenium wall opening of every stage with a height greater than 50 feet (15 240 mm) required to have a fire-resistance rating by Section 410.3.4 shall be provided with a fire curtain of approved material or an approved water curtain complying with Section 903.3.1.1. The fire curtain shall be designed and installed to intercept hot gases, flames and smoke, and to prevent a glow from a severe fire on the stage from showing on the auditorium side for a period of 20 minutes. The closing of the fire curtain from the full open position shall be effected in less than 30 seconds, but the last 8 feet (2438 mm) of travel shall require not less than 5 seconds.

Proponent’s Reason: The changes to 410.3.5 will clarify when a fire curtain is needed by referencing the requirements for a proscenium wall. The inclusion of fire curtain versus curtain better defines intended requirements. A water curtain, also allowed in this section, will not prevent a glow from a severe fire on the stage from showing on the auditorium side for a period of twenty minutes and a water curtain does not have a closing time. This inclusion of fire curtain will therefore remove questions about the application language in this section.

Committee Action: Disapproved

Committee Reason: Sufficient justification for the change has not been presented. Current text better reflects the codes’s intent.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory J. Cahanin, Cahanin Fire Code Consulting, requests Approved as Submitted.
Commenter’s Reason: This change is primarily editorial in content and does not change the application of the proscenium curtain requirements from the current edition. In 410.3.4 the proscenium wall requirements are established at two hours based upon height. Where a two-hour proscenium wall is required an opening protective under this section is also required. For stages with a one-hour wall requirement the IBC calls the wall a fire barrier wall, not a proscenium wall. Referencing 410.3.4 versus height provides consistency in the code style.

The addition of the word ‘fire’ in front of curtain is to clarify that the section is addressing a fabric curtain versus the water curtain option in the second sentence. Without the addition of the word fire in front of curtain it could be interpreted that the water curtain will also have to meet all the performance criteria contained in the section.

G85-02
419 (new)

Proposed Change as Submitted:

Proponent: Fire Chief Jackie Gibbs, Chairman, Southeastern/Southwestern Association of Fire Chiefs Code Committee; representing SBCCI Code Action Committee

1. Add new text as follows:

SECTION 419
COMPUTER/DATA PROCESSING EQUIPMENT ROOMS

419.1 General. Computer/data processing equipment rooms shall comply with the requirements of NFPA 75.

2. Add new referenced standard to Chapter 35 as follows:

NFPA 75—99 Electronic Computer/Data Processing Equipment

Proponent’s Reason: Guidance is needed for the fire inspector relating to computer data processing rooms.

Analysis: The document being proposed for reference, NFPA 75, has not been reviewed for compliance with Section 3.6 of the ICC Code Development Process for the International Codes since copies have not been provided by the proponent.

Committee Action: Disapproved

Committee Reason: Copies of the proposed referenced standard, NFPA 75, were neither submitted to the committee for consideration in the proposed change nor submitted for review to determine its compliance with Section 3.6 of the ICC Code Development Process for the International Codes. A definition of “computer/data processing equipment rooms” is needed to avoid misapplication of the requirements.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Mel Cosgrove, City of Hoover Fire Department, AL, requests Approved as Submitted.

Commenter’s Reason: Currently there are no special provisions for a computer/data processing room in the IBC. The proposed provision was taken from the Standard Building Code in it’s entirety.

The reason for disapproval, stated in the 2002 report of public hearing, is that NFPA 75 was not submitted by the proponent for review. This reason does not hold water. NFPA 75 is a standard that is maintained in each model code groups library and could be easily accessed by the staff to check for compliance to Section 3.5 of the ICC code development process. When a code official submits a proposal that includes a reference to a standard such as NFPA 72 (Fire Alarms) or NFPA 13 (Automatic Fire Sprinklers) they do not supply a copy of those standards and surely they do not supply a copy to each member of the code development committee. If this were the case a code official could not afford to submit a proposal that included a referenced standard.

The second printed reason was that the definition for computer/data processing rooms was not defined. Chapter One of NFPA 75 addresses the applicability of this chapter and it is based on certain risk factors.

G88-02
503.1.1; 506.1.1, 506.4

Proposed Change as Submitted:

Proponent: William W. Stewart, FAIA, Stewart Schaberg/Architects LLC

Revise as follows:

503.1.1 Basements. Basements need not be included in the total allowable area provided they do not exceed the area permitted for a one-story building.

506.1.1 Basements. A single basement which is not considered a story above grade need not be included in the total allowable area provided such basement does not exceed the area permitted for a one-story building.

506.4 (Supp) Area determination. The maximum aggregate area of a building shall be determined by multiplying the allowable area per floor ($A^*$), as determined in Section 506.1, by the actual number of stories up to a maximum of three stories.
that are a story above grade shall be considered a story for purposes of this calculation.

**Exception:** Unlimited area buildings in accordance with Section 507.

**Proponent’s Reason:** Section 503.1.1 is deleted because it is almost a copy of Section 506.1.1. Section 506.1.1 limits the exception to a single basement while Section 503.1.1 leaves the door open for multiple basements to be of this increased size. Section 506.1.1 is the right place for this information.

A story can be a basement and still be a story above grade. See 502 definition. When this situation occurs the added text in 506.1.1 clarifies that this type of basement should be treated as a story even though it meets the definition of basement. Aggregate and actual are added to Section 506.4 as clarifications. The last sentence of Section 506.4 is added to coordinate with Section 506.1.1 and make it clear that all stories above grade shall be considered as stories for purposes of determining the maximum building size.

Without these changes it would be easy to argue that a basement with dirt 1 inch above the finished floor in one corner of the building could meet the exception in Section 506.1.1 thus creating an additional floor not covered by the general area limitation.

For the “normal” building there should not be any economic impact caused by this change.

**Committee Action:** Disapproved

**Committee Reason:** This proposed code change, if approved, would cause confusion in understanding the text. The clarification provided by code change G102-02 is preferred.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

William W. Stewart, Stewart Schaberg/Architects LLC, requests Approved as Modified by this comment.

Replace the proposal with the following:

506.1.1 Basements. A single The total basement area need not be included in the total allowable area provided the basement area does not exceed the area permitted for a one-story building and the basements are not considered a story above grade.

**Commenter’s Reason:** 506.1.1 is the right place for this requirement. 503.1.1 is deleted because it is almost a copy of 506.1.1. “Almost” is the key word. 503.1.1 clearly allows multiple basements. 506.1.1 does not allow more than one basement. Multiple basements should be allowed because multiple basements are by nature more compartmented than one large single basement. Thus multiple basements are at least as safe as one large basement.

A story can be a basement and still be a story above grade. See the definition in 502. A basement that is a story above grade is considered a story as limited in Table 503. Shouldn’t the same type of limitation apply for the area of that basement?

When a basement that is a story above grade occurs the added text in 506.1.1 clarifies that it should be treated as a story for purposes of area limitation even though it might have a small amount of dirt piled up at one corner and meet the definition of basement.

Without the insertion of “basements are not considered a story above grade” it would be easy to argue that a basement with dirt 1 inch above the finished floor in one corner of the building could meet the exception in 506.1.1 thus creating an additional floor not covered by the general area limitation.

In Pittsburgh a number of people had a hard time considering any basement as a story. My answer to them takes the form of a question. Consider a building with three floors above a basement. This building has a stair connecting all levels. Should the stair enclosure (per 1005.3.2) have a two hour or one hour rating? If the answer is two hours the basement is a floor whether or not that basement is a story above grade.

“Area” is added because this section is controlling basement areas not basements.

For the “normal” building there should not be any economic impact.

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**G94-02**

**504.2, 506.3**

**Proposed Change as Submitted:**

**Proponent:** Gregory R. Keith, Professional Heuristic Development; representing The Boeing Company

**Revise as follows:**

**504.2 Automatic sprinkler system increase.** For Where a buildings protected is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story. For Group R buildings protected equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story, but shall not exceed four stories or 60 feet (18 288 mm), respectively. These increases are permitted in addition to the area increase in accordance with Section 506.3.

**Exceptions:**
1. Group 1-2 of Type IIb, III, IV or V construction.
2. Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Footnote d.

**506.3 (Supp) Automatic sprinkler system increase.**
Where a building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by 200 percent (I_s =200 percent) for multi-story buildings and 300 percent (I_s =300 percent) for single-story buildings. These increases are permitted in addition to the height increases in accordance with Section 504.2.

Exceptions:
1. Buildings with an occupancy in Group H-1, H-2 or H-3
2. Fire-resistance rating substitution in accordance with Table 601, Footnote d.

Proponent’s Reason: The proposed revisions are somewhat editorial in nature. They simply enhance usability by creating cross references and consistent charging language statements. Footnote d to Table 601 allows for fire-resistance rating substitution under certain conditions. Those conditions include the proviso that the required approved automatic sprinkler system cannot also be used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The proposal adds an appropriate cross reference exception to each of the referenced sections. Additionally, the charging language at Sections 504.2 and 506.3 has been modified to be consistent with each other and other similar provisions elsewhere in the code. The proposed revisions will assist users of the code and reduce the likelihood of an error in application of technical provisions.

Committee Action: Approved as Modified

Modify proposal as follows:

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story. These increases are permitted in addition to the area increase in accordance with Section 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story, but shall not exceed four stories or 60 feet (18 288 mm), respectively.

Exceptions:
1. Group 1-2 of Type IIB, III, IV or V construction.
2. Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Footnote d.

506.3 (Supp) Automatic sprinkler system increase. Where a building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by 200 percent (I_s =200 percent) for multi-story buildings and 300 percent (I_s =300 percent) for single-story buildings. These increases are permitted in addition to the height increases in accordance with Section 504.2.

Exceptions:
2. Fire-resistance rating substitution in accordance with Table 601, Footnote d.

Committee Reason: Based on the proponent’s published reason. The modification relocates the last sentence to a more appropriate position following the text to which it refers.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Modify proposal as follows:

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story. These increases are permitted in addition to the area increases in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story, but shall not exceed four stories or 60 feet (18 288 mm), respectively.

Exceptions:
1. Group 1-2 of Type IIB, III, IV or V construction.
2. Group H-1, H-2, H-3 or H-5.
3. Fire-resistance rating substitution in accordance with Table 601, Footnote d.

506.3 (Supp) Automatic sprinkler system increase. Where a building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by 200 percent (I_s =200 percent) for multi-story buildings and 300 percent (I_s =300 percent) for single-story buildings. These increases are permitted in addition to the height and story increases in accordance with Section 504.2.

Exceptions:
2. Fire-resistance rating substitution in accordance with Table 601, Note d.

Commenter’s Reason: This code comment is only submitted to further clarify the intent of these code sections to new code users.

The original reason for this code proposal was “…editorial in nature…”. The Code Committee agreed, but in its haste to approve, the Committee missed two suggestions from the floor testimony for further clarification of these sections:

1. There are two means of achieving area increases in the IBC: one for sprinkler systems under Section 506.3 (NFPA 13 systems only), and the other for open frontage under Section 506.2. Both of these area increases are permitted when an NFPA 13 compliant sprinkler system is installed, so both sections should be referenced by Section 504.2 to ensure proper application of the code.
2. Section 504.2 permits both a maximum height increase of 20’ and a maximum number of stories increase by one story. The addition of the words “…and story…” in Section 506.3 will clarify this point so the Code user will not think
that ONLY a height increase and not a story increase are permitted under Section 506.3.

G98-02

506.2.1

Proposed Change as Submitted:

Proponent: Al Godwin, CBO, City of Fort Worth, TX

Revise as follows:

506.2.1 (Supp) Width limits. \( W \) must be at least 20 feet (6096 mm) and the quantity \( W \) divided by 30 shall not exceed 1.0.

Exception: The quantity \( W \) divided by 30 shall be permitted to not exceed 2.0 when all of the following conditions exist:

1. The building is permitted to be unlimited in area by Section 507; and,
2. The only provision preventing unlimited area is compliance with the 60’ public way or yard requirement, as applicable.

Proponent’s Reason: Buildings permitted to have unlimited area at 60’ should be permitted to have additional area calculations between 30’ to 60’ as well. This replaces a sentence that was removed by G95-00, which was confusing.

Committee Action: Approved as Submitted

Committee Reason: Based on the proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Charles Clark, AIA, P.E., National Concrete Masonry Association (NCMA), representing Masonry Alliance for Codes and Standards (MACS), requests Disapproved.

Commenter’s Reason: This code change should be disapproved for several reasons. The first is that it addresses the same issue as Code Change G141-02, which was approved, but does it in a different manner which only adds to the confusion.

The second is the exception is quite confusing as to how it is to be interpreted and enforced. It starts out in a negative fashion by allowing \( W \) divided by 30 “to be permitted to not exceed 2.0”. However, the base paragraph to which it is an exception states that it shall not exceed 1.0. Second it is not clear what Item 1 intends. If the building is permitted to be unlimited in area, then why is it necessary to be utilizing Section 506.2.1, which calculates allowable area increases based on open space surrounding the building?

Furthermore, Section 507.4 Reduced Open Space has provisions that allow the 60 foot required minimum open space to be reduced to not less than 40 feet under specific conditions for up to 75% of the perimeter of the building. Also, Section 507.8 does not specify a minimum width of 60 feet, but rather a minimum width that is not less than 1 ½ times the height of the building.

Third, Item 2 is also confusing since it talks about preventing an unlimited area whereas Section 507 is intended to allow unlimited area buildings under specific conditions. Again, if unlimited area buildings are involved, there is no need to rely upon Section 506.2.1.

It should also be noted that the IBC is already more liberal than two of the three Model Building Codes on the base requirement for the minimum width of open space necessary to qualify for an allowable area increase based on open frontage, since it allows 20 feet whereas the other two model building codes require a minimum of 30 feet. Thus, it is not appropriate for \( W \) to be increased beyond the value of 1.0. That would only result in larger building areas, which are already too large for the given types of construction based on the occupancy of the building as compared to the three model codes upon which this code is based.

In summary, it is not clear as to the actual intended purpose of the proposed new exception to Section 506.2.1 in the (Supp), which is used to determine the multiplying factor \( W \) in the formula for allowing an area increase in Table 503 for open frontage. Therefore, we urge the voting membership to accept this Public Comment and Disapprove this code change.

G114-02

603.1

Proposed Change as Submitted:

Proponent: Yung Kao, AIA, CBO, City of Monterey Park, California

Revise as follows:

SECTION 603

COMBUSTIBLE MATERIALS IN TYPES I AND II CONSTRUCTION

603.1 (Supp) Allowable combustible materials. In addition to the applications permitted under Section 602, combustible materials shall be permitted in buildings of Type I or Type II any type of construction in the following applications and in accordance with Section 603.1.1 through 603.1.3:

1 through 20 (No change to current text)

21. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 716.5.
Proponent’s Reason: Combustible materials permitted under this section, such as thermal and acoustical insulation, window and door frames, combustible aggregate in concrete mixture, nailing and furring strips, etc., should be allowed for the exterior walls in Types III and IV constructions as well.

Committee Action: Disapproved

Committee Reason: This proposed code change, if approved, would apply to all types of construction where the current text only applies to Types I and II construction. The resulting provisions would over-regulate the use of combustible materials in combustible construction types. The reason statement expresses concern over the use of combustible materials in the exterior walls of Types III and IV construction, however current Sections 602.3 and 602.4 adequately regulate the use of wood in the exterior walls of Types III and IV construction.

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Yung Kao, City of Monterey Park, CA requests Approved as Submitted.

Commenter's Reason: The Committee apparently misunderstood the proposed code change when it stated that "...The resulting provisions would over-regulate the use of combustible materials in combustible construction types." In fact, the proposed change is to seek relief from the current code's over-regulation on the use of combustible materials in combustible construction types.

Currently, those combustible materials listed under Section 603.1 are allowed in the exterior walls of Types I and II constructions, but not allowed in the exterior walls of Types III and IV. Provisions in the early years indicated that it was never the code's intent to set a more restrictive combustibility standard for the exterior walls in Types III and IV constructions than in Types I and II. This proposal would allow those combustible materials under Section 603.1, which are currently permitted in Types I and II, to be used in Types III and IV as well.

G117-02

1207.2

Proposed Change as Submitted:

Proponent: Gilbert Gonzales, Murray City Corp.; representing Utah Chapter of ICBO

Revise as follows:

1207.2 (Supp) Minimum ceiling heights. Occupiable spaces, habitable spaces and corridors shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Rooms in one and two family dwellings, bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

Exceptions: (No change to current text)

THIS PROPOSAL ACHIEVES TECHNICAL CONSISTENCY BETWEEN THE IBC AND IRC. THE FOLLOWING TEXT OF THE IRC IS SHOWN FOR INFORMATION PURPOSES ONLY.

R305.1 (Supp) Minimum height. Habitable rooms, hallways, corridors, bathrooms, toilet rooms, laundry rooms and basements shall have a ceiling height of not less than 7 feet (2134 mm). The required height shall be measured from the finish floor to the lowest projection from the ceiling.

Exceptions:

1. Beams and girders spaced not less than 4 feet(1219 mm) on center may project not more than 6 inches (152 mm) below the required ceiling height.

2. Ceilings in basements without habitable spaces may project to within 6 feet, 8 inches(2032 mm) of the finish floor; and beams, girders, ducts or other obstructions may project to within 6 feet, 4 inches (1931 mm) of the finished floor.

3. Not more than 50 percent of the required floor area of a room or space is permitted to have a sloped ceiling less than 7 feet (2134 mm) in height with no portion of the required floor area less than 5 feet (1524 mm) in height.

4. Bathrooms shall have a minimum ceiling height of 6 feet 8 inches (2036 mm) over the fixture and at the front clearance area for fixtures as shown in Figure R307.2. A shower or tub equipped with a showerhead shall have a minimum ceiling height of 6 feet 8 inches (2036 mm) above a minimum area 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.

PropONENT'S REASON: There are one and two family dwellings which will not fall within the scope of the IRC for certain aspects of their construction. The nonstructural requirements for these should be no different than the home next door that is constructed under the IRC. The proposed change is for consistency with IRC Section R305.1.

Committee Action: Disapproved

Committee Reason: A proposal was submitted in the 2001 cycle to
require a 7 foot 6 inch ceiling height in the IRC. It was defeated in large measure due to home builder testimony that they need to retain the 7 foot height in order to compete with manufactured housing. There is no reason to lower the IBC standard in order to compete with the manufactured housing industry.

Assembly Action: Approved as Submitted - Motion Failed

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gilbert Gonzales, Murray City Corp., representing Utah Chapter ICC, requests Approved as Submitted.

Commenter's Reason: The only reason this change was proposed was to achieve technical consistency between the IRC and IBC. There are one and two family dwellings which will not fall within the scope of the IRC for certain aspects of their construction. The nonstructural requirements for these should be no different than the home next door that is constructed under the IRC. There is no substantive reason there should be a difference.

G124-02
1210 (new)

Proposed Change as Submitted:

Proponent: Marsha K. Mazz, U.S. Architectural and Transportation Barriers Compliance Board; representing U.S. Access Board

Add new text as follows:

SECTION 1210 – ACOUSTICAL PERFORMANCE OF LEARNING SPACES

1210.1 Scope. This section provides acoustical performance criteria and design requirements for learning spaces in Group B and E occupancies. These provisions specify maximum background noise levels and reverberation times for learning spaces, and minimum Sound Transmission Class (STC) and Impact Insulation Class (IIC) ratings for walls, floors-ceiling, and roof-ceiling assemblies.

1210.1.1 Information required. The registered design professional shall indicate on the plans the following information:

1. The background noise level and reverberation time for each space that is required to conform to Table 1210.3.1.

2. The STC rating of each wall, floor-ceiling and roof-ceiling assembly that is required to conform to Table 1210.3.3.

3. The IIC rating of each floor-ceiling assembly that is required to conform to Section 1210.3.4.

The registered design professional shall also submit the analysis, calculations or other data substantiating that the design complies with the requirements of this section.

1210.1.2 Enforcement. To determine compliance with this section, the building official shall determine that the information indicated on the plans meets the requirements of this section. Field testing to demonstrate compliance is not required.

1210.2 Definitions

1210.2.1 General. The following words and terms shall, for the purposes of this section, have the meanings shown herein.

Learning spaces. Spaces within buildings that fall into two categories: (a) core and (b) ancillary learning spaces.

Core learning spaces. Spaces for educational activities where the primary functions are teaching and learning and where good speech communication is critical. These spaces include, but are not limited to, classrooms, (enclosed or open plan), instructional pods or activity areas, small group instruction rooms, conference rooms, libraries, speech clinics, offices used for educational purposes, and music rooms for instruction, practice or performance.

Ancillary learning spaces. Spaces where good communication is important to a student’s educational progress but for which the primary educational functions are informal learning, social interaction, or similar activity other than formal instruction. These areas include, but are not limited to, corridors, cafeterias, gymasia, and indoor swimming pools.

A-weighted sound level. Sound pressure level measured with a conventional frequency weighting that approximates how the human ear hears different frequency components of sounds at typical listening levels for speech. The A-weighting attenuates the low frequency (or low pitch) content of a sound. A-weighted sound level is expressed in decibels, unit symbol dB.

C-weighted sound level. Sound pressure level measured with a conventional frequency weighting that does not significantly attenuate the low frequency (or
low pitch) content of a sound. C-weighted sound level is expressed in decibels, unit symbol dB.

**One-hour-average A-weighted or C-weighted sound level.** Level of the A-weighted or C-weighted time-mean-square sound pressure averaged over a one-hour period. One-hour-average sound level is expressed in decibels, unit symbol dB.

**Background noise level.** Sound in a furnished, unoccupied learning space, including sounds from all adjacent spaces, outdoors, and building services and utilities operating at their maximum levels. This excludes sound generated by people within the building or sound generated from instructional equipment.

**Steady background noise.** Noise from building services and utilities, and from outdoor noise sources that is fairly constant over time.

**Unsteady background noise.** Time-varying noise from transportation sources such as aircraft or vehicle traffic or from other time-varying outdoor and indoor noise sources. Unsteady background noise varies substantially over time.

**Reverberation.** An acoustical phenomenon that occurs in an enclosed space when sound persists in that space as a result of repeated reflection or scattering from surfaces enclosing the space or objects in the space.

**Reverberation time.** A measure of the amount of reverberation in a space and equal to the time required for the level of a steady sound to decay by 60 dB after it has been turned off. Reverberation time is expressed in seconds, unit symbols.

**Sound Transmission Class (STC).** Single number rating for the acoustic attenuation of airborne sound passing through a partition or any other building element such as a wall, roof, or door as measured in an acoustical testing laboratory.

**Impact Insulation Class (IIC).** Attenuation of structure borne sound through floor or floor-ceiling assemblies from floor impacts into the space below.

1210.3 Acoustical performance criteria and noise isolation requirements. Acoustical performance criteria and noise isolation requirements shall comply with Sections 1210.3.1 through 1210.3.3. For the purposes of 1210.3.1 and 1210.3.2 it shall be assumed that the learning spaces are furnished consistent with their use and the building is unoccupied.

1210.3.1 Background noise levels. In learning spaces, the maximum one-hour time-average A-weighted steady background noise level in the noisiest continuous 1-hour period during times when learning activities take place shall not exceed the levels specified in Table 1210.3.1. The maximum one-hour time-average C-weighted steady background noise levels shall not exceed the A-weighted levels in Table 1210.3.1 by more than 20 dB. Maximum background noise levels apply for learning spaces when portable and permanent (built in) instructional equipment is off, doors and windows are closed, and exterior and interior noise sources are operating simultaneously.

1210.3.2 Reverberation times. The reverberation times in core learning spaces shall not exceed the limits specified in Table 1210.3.1.

Exception: Spaces for music instruction, practice, and performance.
TABLE 1210.3.1
MAXIMUM A-WEIGHTED STEADY BACKGROUND NOISE LEVELS AND MAXIMUM REVERBERATION TIMES IN LEARNING SPACES

<table>
<thead>
<tr>
<th>Learning space</th>
<th>Maximum one-hour-average A-weighted steady background noise level</th>
<th>Maximum one-hour-average A-weighted steady background noise level dB</th>
<th>Maximum reverberation time for sound pressure levels in octave bands with mid-band frequencies of 500, 1000 and 2000 Hz s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core learning space with enclosed volume &lt; 10 000 ft³ (&lt; 283 m³)</td>
<td>35</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Core learning space with enclosed volume &gt; 10 000 ft³ and £ 20 000 ft³</td>
<td>35</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Core learning space with enclosed volume &gt; 20 000 ft³ (&gt; 566 m³) and all ancillary learning spaces</td>
<td>40</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

a. The limits on A-weighted background noise levels in table 1 shall be increased by 5 dB when the noisiest hour is dominated by transportation noise and the following conditions apply to the A-weighted background noise level. For core learning spaces with enclosed volumes not greater than 20 000 ft³, this level does not exceed 40 dB for more than 10% of this noisiest hour. For core learning spaces with enclosed volumes greater than 20 000 ft³ and for ancillary learning spaces, this level does not exceed 45 dB for more than 10% of this noisiest hour.
b. The maximum one-hour time-average C-weighted steady background noise levels shall not exceed the levels in this table by more than 20 dB. (See Section 1210.3.1).

1210.3.3 Noise isolation design. Wall, floor-ceiling, and roof-ceiling assemblies that separate enclosed or open plan core learning spaces from adjacent spaces shall have minimum STC ratings in Table 1210.3.3 when tested in conformance with ASTM E 90.

Table 1210.3.3
MINIMUM STC RATINGS REQUIRED FOR SINGLE OR COMPOSITE WALL, FLOOR-CEILING AND ROOF-CEILING ASSEMBLIES THAT SEPARATE A CORE LEARNING SPACE FROM ADJACENT SPACES

<table>
<thead>
<tr>
<th>ADJACENT SPACES</th>
<th>Common use and public use toilet rooms and bathing rooms</th>
<th>Corridor b Staircase, Office or Conference room b</th>
<th>Music room c Mechanical equipment Room c Gymnasium, Swimming pools, and Cafeteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other enclosed or open plan core learning space a Speech clinic, Health care room, and Outdoors</td>
<td>50</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>53</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

a. The STC rating for entry doors in core learning spaces shall not be less than 30.
b. The basic wall, exclusive of the door, shall have an STC rating of 45.
c. The STC rating for interior entry doors in music rooms shall be not less than 40.
d. For mechanical equipment spaces containing fans circulating 500 cubic feet/minute (140 cubic meters/minute) or more, the minimum STC rating shall be 60. For lesser flow rates, the minimum STC rating shall be 45 provided the requirements of Table 1210.3.1 are met.
1210.3.4 Impact Insulation Class (IIC) rating - The floor-ceiling assemblies of occupied rooms located above core learning spaces shall have IIC ratings of at least 50. If a room below is an ancillary learning space, the floor-ceiling assembly shall have a minimum IIC rating of 45. These IIC ratings shall apply without carpeting on the floor in the room above. For a gymnasium, dance studio, racquetball court, or similar space with high floor impact activity, the minimum IIC rating of the separating floor-ceiling assembly shall be 70 when located above a core learning space with an enclosed volume not greater than 20,000 ft³ (566 m³), 65 when located above a core learning space with an enclosed volume greater than 20,000 ft³ (566 m³), and 65 when located above an ancillary learning space. Testing for IIC ratings shall be in accordance with ASTM E 492.

Proponent’s Reason: The purpose of this proposed change is to add new provisions for acoustical performance and design requirements for classrooms and other learning spaces. The reason for the proposed change is that the code does not currently address this matter. Conformance to these criteria and requirements is needed to achieve a high degree of speech intelligibility in learning spaces - a vital part of the education process for both children and adults.

Good acoustical qualities are essential in classrooms and other learning spaces in which speech communication is an important part of the learning process. Excessive background noise or reverberation in such spaces interferes with speech communication and thus presents an acoustical barrier to learning. The classroom is an environment in which spoken language communication facilitates and enables students to learn essential academic, social, and cultural skills. Thus, the classroom serves as a communication channel for learning and should be free of acoustical barriers.

Intensive and continuous learning of social, intellectual, and communication skills occurs throughout childhood. Educational research studies have shown that learning is predicated on the ability to communicate with spoken language, and that language input and language proficiency form the bases for most cognitive skills. Other research has shown that perception of spoken language provides the foundation for the ability to read and write. Communication with spoken language is essential to most classroom learning activities. Typically, as much as 60% of these activities involve listening to and participating in spoken communications with the teacher and other students. Thus, the central role of spoken language in classroom learning underscores the need for a clear communication channel accessible to all students and teachers.

Communication with spoken language can occur successfully only when speech intelligibility is high. Research in speech perception has found that when no background noise is present, speech intelligibility depends on the sound level of the speech, and in part on the absence of excessive reverberation. For these reasons, this proposal encompasses learning environments for children (Group E) and adults (Group B). This is consistent with the intent of the ANSI standard on which the proposal is based. The background research and studies used in the development of the standard considered both children and adults.

Background noise and reverberation

Most speech communication in classrooms occurs in the presence of background noise. When background noise is present, intelligibility depends on the sound pressure level of the speech and also on the level of the speech relative to the level of the noise, that is, the signal-to-noise ratio. Intelligibility increases as the signal-to-noise ratio increases, either by raising the speech level or by decreasing the background noise level. Classrooms are enclosed spaces in which sound produces reverberation. Reverberation times in excess of 0.4 seconds to 0.6 seconds reduce speech intelligibility. When both background noise and excessive reverberation are present, their effects on speech intelligibility are additive for individuals with normal speech, language, and hearing abilities. Speech perception research has shown that individuals with impaired speech, language, and hearing abilities require at least 3 db higher signal-to-noise ratios to offset the negative effects of reverberation, as compared with individuals without impairments.

Scholastic achievement and the classroom acoustical environment

The link between the acoustical barriers in the classroom and the scholastic achievement of students is known. Reading and math grade-equivalent scores decrease between the noisiest and quietest environments and a cumulative, compounded effect of poor acoustics on learning as a student progresses through school has been found. Additional factors that influence the effect of acoustics barriers on learning for young students include their age, hearing acuity, and English language proficiency. Young children are more susceptible to the effects of background noise and reverberation on communication. Young children with temporary hearing impairment caused by common ear infection or mild to severe hearing impairment have significantly lower speech intelligibility in classrooms with high background noise. However, both the normally hearing and the hearing-impaired children had good speech intelligibility in quiet environments. Children for whom English is not the first or primary language require more favorable signal-to-noise ratios in difficult listening situations to achieve the same level of intelligibility as children with normal English proficiency.

Acoustical performance criteria and noise isolation design requirements

The acoustical performance criteria in Table 1210.3.1 and the noise isolation design requirements in Table 1210.3.3, are based on absolute and relative levels of speech. However, classroom speech sound levels can be used to specify the expected range of speech sound levels throughout a classroom. These sound levels, together with knowledge of the signal-to-noise ratios and reverberation times necessary for high intelligibility, were used to determine the requirements for acceptable background noise levels and reverberation times for unoccupied, furnished classrooms in Table 1210.3.1. The background noise level criteria were, in turn, used to determine acceptable STC ratings for walls, ceilings, and floors, in Table 1210.3.3, that will prevent the expected typical noise from adjacent occupied enclosed spaces from exceeding the background noise level criteria in the classroom.

The 35 dB acoustical performance criteria for steady classroom background noise levels in Table 1210.3.1 were based on the assumption that a signal-to-noise ratio of at least +15 dB was necessary to ensure that noise will not be a barrier to learning within a classroom. Assuming a minimum speech level of 50 dB, a signal-to-noise ratio of at least +15 dB will always be achieved if the background noise level does not exceed 35 dB.

The acoustical performance criteria for classroom reverberation times were based on the assumption that reverberation times of 0.6 s, or less, in small and mid-sized classrooms and 0.7 s, or less, in large classrooms will not degrade speech intelligibility excessively as long as the A-weighted background noise level does not exceed 35 dB. The reverberation times in Table 1210.1 are for unoccupied, furnished spaces. For occupied spaces, the reverberation times are expected to be 0.1 s to 0.2 s less. Thus, the acoustical performance criteria for both steady background noise levels and reverberation times should be satisfied simultaneously to ensure the elimination of acoustical barriers to classroom learning.

ANSI Standard S12.60

An ANSI Standard, ANSI S12.60, Acoustical Performance
Criteria, Design Requirements and Guidelines for Schools, is under development and is the technical basis for this proposal. Development of the standard was initiated at the request of the Access Board in recognition of this as an accessibility issue and in response to growing demand for federal regulation to address the problem. Although the Board views the need to be critical, the Board would prefer that this be addressed in private sector codes and standards and be regulated through state and local building code enforcement. This is not an entirely new issue for building codes in that sound control is currently regulated in residential occupancies.

The ANSI standard will contain the information and methodology necessary to develop a design that complies with these requirements. The objective for incorporating this in the code was to require acoustical performance (scoping) and simply reference the standard. Unfortunately, the standard will not be in compliance with the ICC referenced standards criteria and therefore cannot be referenced. As such, this proposal extracts the essential technical criteria from the standard and presents it in mandatory, enforceable text. The standard developer will pursue development of this, or perhaps a code-language version of the standard, that will comply with ICC criteria and, when completed, will propose a change to substitute these provisions with a reference to the standard. In the interim, these provisions are technically consistent with the standard and will serve to address the issue until a referenceable standard is completed.

Annex C provides design criteria for acoustical treatment for control of reverberation. Annex B and D of the standard provide criteria for noise control of building services and utilities and noise isolation of building elements respectively which can be used by designers in achieving conformance to this code.

Section-by-section discussion

1210.1 Scope: This is a general scope statement indicating the application of the section and a summary of the requirements contained in the next section. The scope of this, consistent with the ANSI Standard, is proposed for Group B and E occupancies in order to capture learning environments in grammar school, high school and colleges and universities. This is also intended to capture other learning environments that may occur in Group B occupancies such as corporate, business and other skill-based training programs that should also be accessible to people with hearing impairments.

1210.1.1 Information required and 1210.1.2 Enforcement. This establishes the enforcement activities that are expected in determining compliance with these requirements. The intent is to rely on the designer's expertise in developing a complying design, much like structural design requirements, and minimize the impact of this on plan review and inspection steps. The approach is to require the designer to provide the design analysis and substantiation and indicate in the plan the key criteria from that design (background noise levels, reverberation times, STC and IIC ratings). The plan reviewer can then check that those values are consistent with the requirements of Section 1210.1.2 makes it clear that for purposes of code compliance, it is not required that either the designer or the inspector check actual noise levels, reverberation times, or field measure STC and IIC ratings. It is not really feasible to simulate the design assumptions and do field measurements, in much the same way that structural load testing is not required to verify that the structure will carry the anticipated loads. Code compliance will be determined through reliance on the design analysis.

1210.2 Definitions: These define key terms that are used in the provisions and are taken from and consistent with the ANSI standard. Note that in the definition of background noise level, it is established that the requirements do not apply to noise generated within a classroom by its occupants or to the noise from portable or permanent built-in equipment used during the course of instruction, such as audiovisual equipment and computers.

1210.3 Acoustical performance criteria and noise isolation requirements: This section introduces the subsections containing specific acoustical performance requirements. It specifically indicates that the design can assume that the space is furnished in a typical manner. This is to the designers benefit as furnishings aid in reducing background noise and reverberation and will help keep the cost of compliance down. It is acknowledged that furnishing schemes can change in on-going occupancy and cannot be controlled by the designer or the code official. Compliance will be based on an assumed, typical arrangement and minor variations that may occur with actual furnishing arrangements are being discounted.

1210.3.1 Background noise levels. Background noise levels are controlled by specifying limits for steady noise generated within the unoccupied building by building services and utilities, by specifying minimum noise isolation between adjacent learning spaces by internal school building elements and between these spaces and outdoor noise sources provided by the building envelope. This section refers to Table 1210.3.1 for the maximum background noise level and identifies the conditions that are to be assumed for the design analysis. The information in the ANSI standard provides a designer the methodology for determining the A-weighted and C-weighted values. This will require the designer to determine or assume information on external noise sources that are specific to the site. The code official is not expected to make that information available since it is site-specific. Once reasonable assumptions are made, the designer will follow the analysis procedures in the ANSI standard.

1210.3.2 Reverberation times. The approach is essentially the same as for background noise levels. The standard provides the design analysis methodology. The exception acknowledges that in rooms where music is played or practiced, it is not feasible to design for the required reverberation limits. Reverberation is controlled by the application of conventional acoustical treatment to achieve the reverberation times specified in the code. This treatment also serves, indirectly, to reduce background noise.

1210.3.3 Noise isolation design; 1210.3.4 IIC ratings. These requirements are determined and enforced in exactly the same manner as for the current requirements in Chapter 12 for STC and IIC ratings in residential occupancies. The wall, floor-ceiling or roof-ceiling assembly separating the spaces identified in these sections must provides appropriate rating.

Bibliography

ANSI S12.60, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools

This proposal will increase the cost of construction.

Committee Action: Disapproved

Committee Reason: This proposed code change, if approved, would introduce unenforceable provisions to the code. It would also place an unreasonable burden on the code official because of the difficulty in quantifying the provisions, the requirements of which are determined by the building owner and the design professional rather than the code official. The provisions would inappropriately apply to occupancy Group B. They would also cause a major increase in the cost of school construction which is already very high and could adversely impact the use of mobile classrooms as an economical temporary fix for school crowding. Carpentry should be allowed to be considered in IIC ratings (Section 1210.3.4). The text being proposed is extracted from a standard that has not been published or submitted for review in accordance with ICC standards policy.

Assembly Action: No Motion

Individual Consideration Agenda
This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Marsha K. Mazz, U.S. Architectural and Transportation Barriers Compliance Board (Access Board) representing U.S. Access Board, requests Approved as Modified by this comment.

Modify proposal as follows:

SECTION 1210 – ACOUSTICAL PERFORMANCE OF LEARNING SPACES

1210.1 Scope. This section provides acoustical performance criteria and design requirements for learning spaces in Group B and E occupancies and in educational occupancies above the 12th grade that are classified as Group B occupancies. These provisions specify maximum background noise levels and reverberation times for learning spaces, and minimum Sound Transmission Class (STC) and Impact Insulation Class (IIC) ratings for walls, floors-ceiling, and roof-ceiling assemblies. These provisions shall not apply to temporary structures.

1210.1.1 Information required. The registered design professional shall indicate on the plans the following information:

1. The background noise level and reverberation time for each space that is required to conform to Table 1210.3.1.
2. The STC rating of each wall, floor-ceiling and roof-ceiling assembly that is required to conform to Table 1210.3.2.
3. The IIC rating of each floor-ceiling assembly that is required to conform to Section 1210.3.4.

The registered design professional shall also submit the analysis, calculations or other data substantiating that the design complies with the requirements of this section.

1210.1.2 Enforcement. To determine compliance with this section, the building official shall determine that the information indicated on the plans meets the requirements of this section. Field testing to demonstrate compliance is not required.

1210.2 Definitions

1210.2.1 General. The following words and terms shall, for the purposes of this section, have the meanings shown herein.

Learning spaces. Spaces within buildings that fall into two categories: (a) core and (b) ancillary learning spaces.

Core learning spaces. Spaces for educational activities where the primary functions are teaching and learning and where good speech communication is critical. These spaces include, but are not limited to, classrooms, (enclosed or open plan), instructional pods or activity areas, small group instruction rooms, conference rooms, libraries, speech clinics, offices used for educational purposes, and music rooms for instruction, practice or performance.

Ancillary learning spaces. Spaces where good communication is important to a student’s educational progress but for which the primary educational functions are informal learning, social interaction, or similar activity other than formal instruction. These areas include, but are not limited to, corridors, cafeterias, gymnasium, and indoor swimming pools.

A-weighted sound level. Sound pressure level measured with a conventional frequency weighting that approximates how the human ear hears different frequency components of sounds at typical listening levels for speech. The A-weighting attenuates the low frequency (or low pitch) content of a sound. A-weighted sound level is expressed in decibels, unit symbol dB.

C-weighted sound level. Sound pressure level measured with a conventional frequency weighting that does not significantly attenuate the low frequency (or low pitch) content of a sound. C-weighted sound level is expressed in decibels, unit symbol dB.

One-hour-average A-weighted or C-weighted sound level. Level of the A-weighted or C-weighted time-mean-square sound pressure averaged over a one-hour period. One-hour-average sound level is expressed in decibels, unit symbol dB.

Background noise level. Sound in a furnished, unoccupied learning space, including sounds from all adjacent spaces, outdoors, and building services and utilities operating at their maximum levels. This excludes sound generated by people within the building or sound generated from instructional equipment.

Steady background noise. Noise from building services and utilities, and from outdoor noise sources that is fairly constant over time.

Unsteady background noise. Time-varying noise from transportation sources such as aircraft or vehicle traffic or from other time-varying outdoor and indoor noise sources. Unsteady background noise varies substantially over time.

Reverberation. An acoustical phenomenon that occurs in an enclosed space when sound persists in that space as a result of repeated reflection or scattering from surfaces enclosing the space or objects in the space.

Reverberation time. A measure of the amount of reverberation in a space and equal to the time required for the level of a steady sound to decay by 60 dB after it has been turned off. Reverberation time is expressed in seconds, unit symbol s.

Sound Transmission Class (STC). Single number rating for the acoustic attenuation of airborne sound passing through a partition or any other building element such as a wall, roof, or door as measured in an acoustical testing laboratory.

Impact Insulation Class (IIC). Attenuation of structure borne sound passing through floor or floor-ceiling assemblies from floor impacts into the space below.

1210.3 Acoustical performance criteria and noise isolation requirements. Acoustical performance criteria and noise isolation requirements shall comply with Sections 1210.3.1 through 1210.3.3. For the purposes of 1210.3.1 and 1210.3.2 it shall be assumed that the learning spaces are furnished consistent with their use and the building is unoccupied.

1210.3.1 Background noise levels. In learning spaces, the maximum one-hour time-average A-weighted steady background noise level in the noisiest continuous 1-hour period during times when learning activities take place shall not exceed the levels specified in Table 1210.3.1. The maximum one-hour time-average C-weighted steady background noise levels shall not exceed the A-weighted levels in Table 1210.3.1 by more than 20 dB. Maximum background noise levels apply for learning spaces when portable and permanent (built in) instructional equipment is off, doors and windows are closed, and exterior and interior noise sources are operating simultaneously.

1210.3.2 Reverberation times. The reverberation times in core learning spaces shall not exceed the limits specified in Table 1210.3.1.

Exception: Spaces for music instruction, practice, and performance.
**TABLE 1210.3.1**
MAXIMUM A-WEIGHTED STEADY BACKGROUND NOISE LEVELS AND MAXIMUM REVERBERATION TIMES IN LEARNING SPACES

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<th>Learning space</th>
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<td>40</td>
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a. The limits on A-weighted background noise levels in table 1 shall be increased by 5 dB when the noisiest hour is dominated by transportation noise and the following conditions apply to the A-weighted background noise level. For core learning spaces with enclosed volumes not greater than 20 000 ft³, this level does not exceed 40 dB for more than 10% of this noisiest hour. For core learning spaces with enclosed volumes greater than 20 000 ft³ and for ancillary learning spaces, this level does not exceed 45 dB for more than 10% of this noisiest hour.

b. The maximum one-hour time-average C-weighted steady background noise levels shall not exceed the levels in this table by more than 20 dB (See Section 1210.3.1).

**1210.3.3 Noise isolation design.** Wall, floor-ceiling, and roof-ceiling assemblies that separate enclosed or open plan core learning spaces from adjacent spaces shall have minimum STC ratings in Table 1210.3.3 when tested in conformance with ASTM E 90.
Commenter’s Reason: The following is offered in response to the various concerns that were raised on this proposal.

Group B occupancies: Concerns were raised about applying these requirements to Group B occupancies generally. The first modification limits application to college, university, and other post-secondary facilities that are classified as Group B occupancies. The term “educational occupancies” appears in the list of Group B occupancies at Section 304.1.

Temporary structures: Concerns were raised that will dramatically affect the ability of school districts to utilize temporary classroom structures. The second modification will establish that the provisions are not applicable to temporary structures.

IIC ratings: Concern was expressed that prohibiting the contribution of carpeting to the IIC ratings is overly restrictive. The third modification deletes this restriction from 1210.3.4.

Enforcement: The committee viewed these provisions as unenforceable. The enforceability of the proposed text is clear and straightforward as expressed in 1210.1.2. The only obligation this text would impose on the code official is to determine that the designer’s submitted information complies with four specific requirements in the text (background noise level, reverberation time, STC ratings and IIC ratings). The concerns surrounding this discussion at the hearing focused on the building official’s potential responsibility should a claim arise after construction that the actual as-built performance does not achieve the levels required by the code. The enforcement situation for the building official is no different than it is now with the current STC and IIC ratings compliance. The building official checks the submitted design information to determine compliance. There is no post-construction measurement of STC levels between dwelling units and no structural load testing of completed structures. This is and always has been the norm for enforcement of those long-standing requirements and this proposal is no different. The perception of an enforcement problem is only that, a perception. The proposed text of 1210.1.2 is clear and adequate.

1210.3.4 Impact Insulation Class (IIC) rating - The floor-ceiling assemblies of occupied rooms located above core learning spaces shall have IIC ratings of at least 50. If a room below is an ancillary learning space, the floor-ceiling assembly shall have a minimum IIC rating of 45. These IIC ratings shall apply without carpeting on the floor in the room above. For a gymnasium, dance studio, racquetball court, or similar space with high floor impact activity, the minimum IIC rating of the separating floor-ceiling assembly shall be 70 when located above a core learning space with an enclosed volume not greater than 20 000 ft² (566 m²), 65 when located above a core learning space with an enclosed volume greater than 20 000 ft² (566 m²), and 65 when located above an ancillary learning space. Testing for IIC ratings shall be in conformance with ASTM E 492.

Cost: The committee was concerned that this represents a major increase in the already high cost of construction. Some costs, e.g. double glazing and ducted HVAC, are already dictated by energy conservation and air quality requirements. Others, e.g. impact attenuation, can be avoided by sensible design. HVAC units can be manufactured to more stringent standards, if required; European equipment is currently available that meets the proposed standard. Slight cost increases for greater sound resistance in exterior walls and interior partitions and added ceiling absorbency may well be offset by lower costs in remedial education programs; school construction costs represent only 10% of a system's annual budget. These requirements do not represent the dramatic cost increase that is feared.

Office Equipment: Concern was expressed in testimony that equipment such as computers and other portable devices used in classrooms contribute noise but are not covered by this proposal, thus making these requirements ineffectual. Developers of the ANSI standard (ANSI/ASA 12.60-2002, now final) are developing a companion standard for the noise output of office equipment that addresses this issue.

G128-02

IBC 3109.5; IRC AG106.3

Proposed Change as Submitted:

Propponent: Gary S. Duren, Code Compliance, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. Delete and substitute as follows:

IBC 3109.5 (Supp) Entrapment avoidance: Where the suction inlet system, such as an automatic cleaning system, is a vacuum cleaner system which has a single suction inlet, or multiple suction inlets which can be isolated by valves, each suction inlet shall protect against user entrapment by an approved antivortex cover, a 12"X 12" (304 mm x 304 mm) or larger grate,
or other approved means.

In addition, all pools and spas shall be equipped with an alternative backup system which shall provide vacuum relief should grate covers be missing. Alternative vacuum relief devices shall include one of the following:

1. Approved vacuum release system
2. Approved vent piping
3. Other approved devices or means

IBC 3109.5 Entrapment avoidance. Suction outlets shall be designed to produce circulation throughout the pool or spa. Single outlet systems, such as automatic vacuum cleaner systems, or other such multiple suction outlets whether isolated by valves or otherwise shall be protected against user entrapment.

3109.5.1 Suction Fittings. All Pool and Spa suction outlets shall be provided with a cover that conforms with ANSI/ASME A112.19.8M, or a 12" X 12" drain grate or larger, or an approved channel drain system.

Exception: Surface skimmers

3109.5.2 Atmospheric Vacuum Relief System Required. All pools and spa single or multiple outlet circulation systems shall be equipped atmospheric vacuum relief should grate covers located therein becomes missing or broken. Such vacuum relief systems shall include at least one approved or engineered method of the type specified herein, as follows:

1. Approved automatic Safety vacuum release system conforming to ASTM F15.51 or ASME A112.19.17, or,
2. Approved vent piping, or
2. 3. An approved gravity drainage system

3109.5.3 Dual Drain Separation. Single or multiple pump circulation systems shall be provided with a minimum of two (2) suction outlets of the approved type. A minimum horizontal or vertical distance of three feet (3') shall separate such outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum relief-protected line to the pump or pumps.

AG106.3 (Supp) Atmospheric Vacuum Relief System Required. All pools and spa single or multiple outlet circulation systems shall be equipped atmospheric vacuum relief should grate covers located therein becomes missing or broken. Such vacuum relief systems shall include at least one approved or engineered method of the type specified herein, as follows:

1. Approved automatic Safety vacuum release system conforming to ASTM F15.51 or ASME A112.19.17, or
2. Approved vent piping, or
2. 3. An approved gravity drainage system

AG106.4 Dual Drain Separation. Single or multiple pump circulation systems shall be provided with a minimum of two (2) suction outlets of the approved type. A minimum horizontal or vertical distance of three feet (3') shall separate such outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum relief-protected line to the pump or pumps.

AG106.5 Pool Cleaner Fittings. Where provided, vacuum or pressure cleaner fitting(s) shall be located in an accessible position(s) at least six (6) inches and not greater than twelve (12) inches below the minimum operational water level or as an attachment to the skimmer(s).

AG108 STANDARDS

AG108.1 General.
The CPSC is aware of thirty (30) reported incidents in spas and hot tubs since 1990, of which ten (10) resulted in drowning deaths as a result of long hair becoming entangled in the drain grates. Typically, these incidents involve females with long, fine hair, who are underwater with their head near a suction inlet. The water flow into the inlet sweeps the hair into and around the outlet cover, and the hair becomes entangled on and around holes and protrusions in the cover. Entrapment occurs because of the tangling, and not necessarily because of the strong suction forces. These cases most often occur in spas, including hot tubs.

Since about 1982, industry voluntary standards for spa and hot tubs require that drain covers be certified for use at a maximum flow rate. It is difficult, however, to determine actual flow rates in custom-built spas, and thus to know if spas are equipped with the proper fitting to prevent hair entanglement. Some fittings available on the market since 1982 are manufactured to provide anti-vortex protection, and do provide a secondary benefit of some limited protection against body entrapment and hair entanglement/entrapment.

**LAYERED PROTECTION**

Due to the severity of the issues the CPSC has developed a series of recommendations entitled “Guidelines for Addressing Potential Entrapment Hazards Associated with Swimming Pools and Spas”. These reports, as well as various State Statutes, have set forth requirements for new construction and retrofitting of existing pool and/or spa installations. These recommendations are herein defined as “Layered Protection”. The best possible protection level against such hazards is only achieved when three (3) layers of protection are provided. All three (3) layers must be required in order to offer the best possible protection against the hazards referenced above and shall minimally include, but are not limited to the following requirements.

**LAYER 1 - PASSIVE DRAIN PROTECTION METHODS**

The CPSC recommendations on drain safety contain the concept of “passive drain protection”. There are two (2) main approaches included under this area. The term passive applies to these methods, as there is no need for moving parts to insure efficient operation.

**B.1.1 Multiple Drain and Channel Systems**

The principle behind installing a multiple drain system is to prevent a single drain opening from becoming the sole inlet to the suction side of the pump. The installation of additional drains effectively diverts the suction between the drains, provided the drain interconnecting piping is the same diameter and the piping configuration produces hydraulic balance.

Alternatively, a “channel type” drain could be installed in such a way as to prevent the “trapping off” or complete blockage of the main drain. The channel, possibly retrofitted onto either or both sides of a 12” X 12” grate, would provide a larger surface area to maintain the desired flow. This channel arrangement would minimize the chance of an entrapment hazard since it would be difficult to completely seal or trap off.

**IMPORTANT NOTE:** The effectiveness of these options against disembowelment injuries is not clearly understood because of the lack of data surrounding the pressure differential required to cause such an injury, and the effect of duration of exposure to the available suction. Disembowelment injuries to children are believed to occur “almost instantaneously” at relatively small pressure differentials. The effectiveness of a multiple drain system in preventing disembowelment is dependent, in part, upon site-specific conditions, i.e. the number of drains, the size of the drains, the hydraulic balance between the drains, and the power of the pumping system.

Gravity Feed and Vent Stack Systems
Gravity Feed Systems
In a gravity feed system a separate tank collects water by means of gravity flow, and the pump suction is then plumbed to the tank. This method of circulating, filtering and/or heating and jetting the pool water removes the direct high vacuum condition from the pool main drains and skimmers, and applies it to the gravity feed tank, which is generally not occupied.

Vent Stack Systems

The use of a vent stack or stacks may remove high vacuum forces from the main drain or skimmer in case a blockage should occur. The vent stack would be connected to the main drain suction line between the drain and the pump and would be open to atmosphere. The laws of physics require the stack to fill with water to a level equal to that of the pool. Should the drain become clogged or obstructed, the pump would then draw the water from the vent stack until air is introduced into the system and the suction is thereby broken.

IMPORTANT INFORMATION: The use of these passive systems may reduce the likelihood of suction entrapment and subsequent drowning, however, the effectiveness of these systems against disembowelment injuries is not known because of the lack of data surrounding the pressure differential required to cause such an injury.

There are some additional concerns regarding the use of vent stack systems. It may be difficult to keep these systems clean of algae, biological contaminants and other infestation. Also, there would be no indication if the vent stack system were to become blocked or obstructed. Should the vent become blocked or obstructed, the safety provided by such a system would be rendered ineffective.

ASME DRAIN PROTECTION METHODS

The American Society of Mechanical Engineers, A112 Plumbing Materials and Equipment Standards Committee developed ANSI/ASME A112.19.8M to address performance requirements for suction fittings used in pools and spas. The standard requires that cover materials be tested for structural integrity. Additionally, the cover must be tested for entrapment/entanglement potential. Suction fitting covers are required to be marked with a flow value in gallons per minute (gpm) that indicates the maximum flow rate at which the cover has been approved.

IMPORTANT INFORMATION: The use of a cover under the conditions at which the maximum flow rate is exceeded can lead to entrapment hazards. A qualified pool professional must, during regular maintenance evaluate the field flow conditions, so as to reasonably determine that the rated flow through the fitting is not being exceeded. The suction fitting cover must be properly matched to the actual flow rate of the pool or spa.

ACTIVE DRAIN PROTECTION METHODS

Electrical Intervention Devices

Electrical Interrupt Devices

There are generally two types of electrical intervention devices. One form of intervention, which some States and the National Electric Code are considering, is an emergency pump cut-off switch located in view of the pool or spa. At the present time these switches are generally located in the electric equipment room, and are in the line of sight of the apparatus as opposed to the line of sight of the pool or spa. Another form of electrical intervention device involves a monitor or switch that responds to a sudden rise in pump suction vacuum by turning off the pump, and/or opening an electrically operated atmospheric vent valve.

IMPORTANT INFORMATION: A cut-off switch or pump shut-off switch should not be considered as a stand alone third layer protection means. It should always be used with other protection means for relieving the high vacuum condition caused by an entrapment condition. In the event of entrapment, the vacuum condition may not be sufficiently relieved by interrupting electrical power to the pump. Such vacuum forces can remain in place and impede rescue efforts.

Safety Vacuum Release System (SVRS) Non-Electric Device

Available data suggests that a Safety Vacuum Release System (SVRS) Non-Electric Device will effectively eliminate body entrapments. A child playing in the immediate vicinity of an SVRS Non-Electric Device-protected drain will cause the device to activate upon sealing off the drain fitting. The device effectively eliminates the high vacuum forces at the protected drain, and body entrapment can in this way be avoided entirely.

IMPORTANT INFORMATION: Due to the lack of physiological data, it cannot be concluded that a Safety Vacuum Release System Non-Electric Device will eliminate all potential for disembowelment.”

### CURRENT CPSC STATISTICS FROM 1/95 TO 7/00

<table>
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<tr>
<th>ENTRAPMENTS</th>
<th>RESULTED IN DEATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 hair</td>
<td>5</td>
</tr>
<tr>
<td>39 body</td>
<td>5</td>
</tr>
<tr>
<td>5 unknown</td>
<td>0</td>
</tr>
</tbody>
</table>

NOTE: 1. All reported cases involve children
2. Above does not include 4 recent Florida entrapment cases resulting in death
3. Does not include entrapments simply recorded as “drowning”.
4. Source Consumer Product Safety Commission


Analysis: The proponent’s intent is to achieve technical correlation on this topic between the IBC and the IRC. Therefore, portions of IRC AG (Supp) 106 not being changed are included for clarity. Also, the documents being proposed for reference, ASTM F15.51 and ASME A112.19.17 have not been submitted by the proponent for review. (Note: Based on responses to inquiries made to both ASTM and ASME, these numbers do not represent standards published by either organization. It is unclear as to what standards the proponent intends to reference.)

ITEM 1 (IBC)

Committee Action: Disapproved

Committee Reason: The standards being proposed for reference have not completed their respective development and publication processes and have not been provided to the committee for its consideration.

Assembly Action: No Motion

ITEM 2 (IRC)

Committee Action: Approved as Submitted

Committee Reason: Based on the proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was
Public Comment 1:

Gary S. Duren, Code Compliance, Inc., requests Public Comment 1 approved as modified by this comment for Item 1.

Modify proposal as follows:

IBC 3109.5 Entrapment avoidance. Suction outlets shall be designed to produce circulation throughout the pool or spa. Single outlet systems, such as automatic vacuum cleaner systems, or other such multiple suction outlets whether isolated by valves or otherwise shall be protected against user entrapment.

3109.5.1 Suction Fittings. All Pool and Spa suction outlets shall be provided with a cover that conforms with ANSI/ASME A1 12.19.8M, or a 12” X 12” drain grate or larger, or an approved channel drain system.

Exception: Surface skimmers.

3109.5.2 Atmospheric Vacuum Relief System Required. All pools and spa single or multiple outlet circulation systems shall be equipped atmospheric vacuum relief should grate covers located therein becomes missing or broken. Such vacuum relief systems shall include at least one approved or engineered method of the type specified herein, as follows:

1. Safety vacuum release systems conforming to ASTM F15.51 or ASME A112.19.17, or
2. An approved gravity drainage system.

3109.5.3 Dual Drain Separation. Single or multiple pump circulation systems shall be provided with a minimum of two (2) suction outlets of the approved type. A minimum horizontal or vertical distance of three feet (3’) shall separate such outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum relief-protected line to the pump or pumps.

3109.5.4 Pool Cleaner Fittings. Where provided, vacuum or pressure cleaner fitting(s) shall be located in an accessible position(s) at least six (6) inches and not greater than twelve (12) inches below the minimum operational water level or as an attachment to the skimmer(s).

Add new referenced standard to Chapter 35 as follows: ASTM F15.51 and ASME A112.19.17

Commenter’s Reason: This IBC Committee disapproved G128-02 [Part 1. IBC 3109.5] because the referenced standard(s) were not completed and were not provided to the committee for its consideration. The referenced standard ASME A112.19.17 is now completed and is provided under a separate cover for Staff’s review. However, as of this date the ASTM document is unavailable and as such it must be editorially and/or administratively deleted from the above referenced proposal.

However unfortunate, it is notable that our past US Secretary of State, James Baker lost his seven year old granddaughter in a spa entrapment during June 2002 in Virginia.

We encourage the approval of this important code change. If such language had been in place and enforced this, yet another young life would have not been lost.

Analysis: The following combinations of action would achieve technical consistency between the IBC and the IRC:

Public Comment 2:

Gary S. Duren, Code Compliance, Inc., requests Public Comment 2 approved as modified by this comment for Item 2.

Modify proposal as follows:

IRC SECTION (Supp) AG106 ENTRAPMENT PROTECTION FOR SWIMMING POOL AND SPA SUCTION OUTLETS

AG106.1 General: Suction outlets shall be designed to produce circulation throughout the pool or spa. Single outlet systems, such as automatic vacuum cleaner systems, or other such multiple suction outlets whether isolated by valves or otherwise shall be protected against user entrapment.

AG106.2 Suction Fittings. All Pool and Spa suction outlets shall be provided with a cover that conforms with ANSI/ASME A112.19.8M, or a 12”X 12” drain grate or larger, or an approved channel drain system.

Exception: Surface skimmers

AG106.3 (Supp) Atmospheric Vacuum Relief System Required. All pools and spa single or multiple outlet circulation systems shall be equipped atmospheric vacuum relief should grate covers located therein becomes missing or broken. Such vacuum relief systems shall include at least one approved or engineered method of the type specified herein, as follows:

1. Safety vacuum release system conforming to ASTM F15.51 or ASME A112.19.17, or
2. An approved gravity drainage system

AG106.4 Dual Drain Separation. Single or multiple pump circulation systems shall be provided with a minimum of two (2) suction outlets of the approved type. A minimum horizontal or vertical distance of three feet (3=) shall separate such outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum relief-protected line to the pump or pumps.

AG106.5 Pool Cleaner Fittings. Where provided, vacuum or pressure cleaner fitting (s) shall be located in an accessible position(s) at least (6) inches and not greater than twelve (12) inches below the minimum operational water level or as an attachment to the skimmer(s).

AG108 STANDARDS

AG108.1 General.

ASTM

ASTM F15.51 ................................................. AG106.3

ASME

ASME A112.19.17 ............................................ AG106.3

Commenter’s Reason: This IBC Committee wisely approved G128-02 [Part 2. IRC AG108.3] Note: The referenced standard ASME A112.19.17 is now completed and is provided under a separate cover for Staff’s review. However, as of this date the ASTM document is unavailable and as such it must be editorially and/or administratively deleted from the above referenced proposal.

Analysis: The following combinations of action would achieve...
technical consistency between the IBC and the IRC:

Item 1 AS  Item 2 AS
or
Item 2 D  Item 2 D
or
Item 1 AM PC  Item 2 AM PC

G132-02
Chapter 34

Proposed Change as Submitted:

Proponent: Jerry R. Tepe, AIA, JRT—AIA Architect; representing American Institute of Architects

Revise as follows:

CHAPTER 34
EXISTING STRUCTURES

Relocate entire Chapter 34 to an Appendix.

Proponent's Reason: With the introduction of the International Existing Building Code, I suspect the current Chapter 34 “Existing Structures” will be deleted. While in the long run, this will be right, until numerous jurisdictions have adopted and used the new IEBC, it would be a good idea to have the current options available to those jurisdictions who have not adopted the new code. As an Appendix, it would only be used by those jurisdictions who specifically adopt it.

Committee Action: Disapproved
Committee Reason: Based on proponent’s request for disapproval.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter’s Reason: I requested the committee to Disapprove this at the Public Hearings so I could bring it forward at the Annual Meeting. My requested action is solely dependent on the action taken on G133 and whether Chapter 34 is approved for removal. While in the long run, this will be right, until numerous jurisdictions have adopted and used the new IEBC, it would be a good idea to have the current options available to those jurisdictions who have adopted the new code. As an Appendix, it would only be used by those jurisdictions who specifically adopt it.

G133-02
Chapter 34; 101.2, 101.4, 101.4.8, 102.6, 110.2, 115.1, 115.5, 202, 501.1, 302.1, 3310.1, 3310.2

Proposed Change as Submitted:

Proponent: John Terry, Chair; representing the International Existing Building Code Drafting Committee

1. Delete the content of Chapter 34 in its entirety (except for the title) and substitute as follows:

3401.1 Scope
Alterations, repairs, additions, moved structures and changes of occupancy to existing structures shall comply with the International Existing Building Code.

2. Revise as follows:

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

Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means of egress and their accessory structures shall comply with the International Residential Code.

Repairs, alterations, and additions to existing buildings and change of occupancy, relocated buildings and historic buildings shall also comply with the International Existing Building Code.

101.4 Referenced codes. The other codes listed in Sections 101.4.1 through 101.4.7, 101.4.8 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

101.4.8 Existing Buildings. The provisions of the International Existing Building Code shall apply to repairs, alterations, additions, change of occupancy, historic buildings and relocated buildings.

102.6 Existing structures. The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change,
When such required elements or devices are being remodeled, altered or repaired, adequate substitute provisions shall be made.

2. When the existing building is not occupied.

3310.1 Stairways required. Where a building has been constructed to a height greater than 50 feet (15 240 mm) or four stories, or where an existing building exceeding 50 feet (15 240 mm) in height is altered, at least one temporary lighted stairway shall be provided unless one or more of the permanent stairways are erected as the construction progresses.

3310.2 Maintenance of exits. Required exits shall be maintained at all times during remodeling or alterations and additions to any building.

Proponent's Reason: The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings. The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001.

This proposed code change is a part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

1. Chapter 1: The proposed modifications make appropriate references to the IEBC for repairs, alterations, etc. and remove such references from the IBC, IMC, and other I Codes where necessary. Additionally, references to Ch. 34 have been changed to refer to the IEBC. Sections to which changes have not been proposed are generic and have no conflict with the IEBC.

2. Chapter 2: The IEBC Drafting Committee had extensive discussions over the definition of certain terms that are most directly related to building repair and alteration. As such, these revised definitions coordinate the IBC and IEBC.

3. Chapter 5, 33 and 34 proposed changes: Same reason as Chapter 1 proposed changes.

Committee Action: Approved as Submitted

Committee Reason: Based on the proponent's published reason. The document, while not "perfect", has been available for public review since August, 2001 and has been subjected to one code change cycle. The IEBC is needed as part of the International Codes family in the 2003 editions.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

J. Michael Davis, C.B.O. & Ron R. Worley, C.B.O., Miami County, Kansas/City of Lenexa, Kansas, representing Miami County, Kansas and Metropolitan Kansas City Chapter ICBO/ICC, requests Disapproved.
Commenter's Reason: The proposal to delete the provisions of IBC Chapter 34 was proposed by the Chair of the IEBC Drafting Committee with the intent of replacing it with the requirements that are contained in the NEW International Existing Building Code.

Based upon the study that I have done of the IEBC there are some fundamental flaws and very liberal allowances that would not allow me to recommend its adoption to my governing body. Over 2/3 of the Building Officials that I have queried have no knowledge of what the IEBC contains.

By deleting the existing provisions in the IBC or other I-Codes we would be blindly accepting a code that I don’t believe many of us were active in developing.

I would like to see at least one full code cycle for building officials to have time to study the IEBC and propose changes through the code process before we begin deleting existing code provisions that we all are comfortable with, even if they are not totally perfect.

Public Comment 2:

Gilbert Gonzales, Murray City Corp., representing Utah Chapter ICC, requests Disapproved.

Commenter's Reason: The IEBC is not ready for prime time and to remove Chapter 34 is a mistake until the other code is ready.

Public Comment 3:

Paul Hayward, City of Farmington, Utah, representing Farmington City, requests Disapproved.

Commenter's Reason: The committee, in their published reason, admitted that “The document, while ‘not perfect’,” as a reason for their 9 – 8 vote in favor. No kidding. This code simply isn’t ready. To assert in a public hearing in April 2002 that the document has been available for public review since August 2001 as a justifiable reason for adoption of a developing but problematic document is just simply amazing. There is no emergency action required in this case. Prepare the document first, then adopt it.

Public Comment 4:

Thomas Meyers, City and County of Broomfield, Colorado, representing Colorado Chapter of ICC, requests Disapproved.

Commenter's Reason: This change effectively eliminates Chapter 34, directing the user to the International Existing Building Code for all existing building issues. We do not believe that one code change cycle is adequate to address the numerous problems and errors in the newly developed IEBC. The first “Public Forum” for this draft was at the end of the long Saturday General Committee code change hearing in Portland, OR. The majority of the people who were there for those Code Change meetings left the room during this portion of the hearing. The General Committee rejected EL3-02 (17-0) stating that, “The IEBC development is incomplete and deferring coverage to the IEBC is premature.” When G133-02 was heard, the committee approved the elimination of Chapter 34 in favor of the IEBC but still cautioned that the document was “not perfect” in their reason statement.

We believe that IBC Chapter 34 is adequate and that the IEBC should remain a separate Code document available for adoption at the jurisdiction’s discretion similar to Property Maintenance Code or the Private Sewage Disposal Code. Please overturn the Committee decision and disapprove this Code Change.
Proposed Change as Submitted:

Proponent: David S. Collins, FAIA, The Preview Group, Inc.; representing The American Institute of Architects

Revise as follows:

506.2.1 Width limits. \( W \) must be at least 20 feet (6096 mm) and the quantity \( W \) divided by 30 shall not exceed 1.0. For one-story buildings which are Group A-4, or two-story buildings of B, E, F, M or S occupancies, \( W \) divided by 30 shall not exceed 2.0.

Proponent’s Reason: A-4, B, E, F, M or S occupancies are all permitted to be unlimited in area by Section 507.2. The current provisions limit the increase to \( W/30 = 1.0 \), which is an increase to the tabular area in Table 503 of 75%. Any additional open perimeter beyond 30 feet will not provide any benefit to the building until it reaches a magic number of 60 feet at which point it will for some reason be allowed to be unlimited. This is inconsistent with the concept of increased safety because of separation between buildings. This change will continue to allow the same percentage of increase beyond the 30 foot limit up to 60 feet.

At the final hearings in 2001, it was pointed out that the occupancies that were allowed to be unlimited were only one- or two-story structures. With this change the code would reflect that limit. As structured the code sets four different standards.

1. The first is buildings that are not allowed to have frontage increase because they do not have the minimum 20 feet of open space between buildings or buildings and property lines.

2. A second standard is set by allowing between 50% and 75% area increases when there is between 20 feet and 30 feet of separation.

3. Open space around a building of between 30 feet of open space and 60 feet establishes the third standard because it is still limited to a maximum increase of 75% because of the limitation on \( W/30 = 1 \).

4. The fourth standard is for unlimited area buildings. These large buildings are allowed when there is a minimum open space around them of 60 feet.

The disconnect in the logic of the code is the fourth standards. No credit is granted to a building for the increased openness, so if a curve were drawn showing the area of any building, it would be flat from the point where the open space becomes 30 feet until it reaches 60 feet. Inexplicably, the curve then becomes a straight line vertically to indicate that the area is unlimited.
Modify proposal as follows:

buildings which are Group A-4, or one- or two-story Group E buildings to be of unlimited area. We believe this code change was somewhat controversial since the Committee split on the vote for Approved as Modified by a vote of 9 in favor and 7 opposed. A subsequent assembly motion for Disapproval was made and the membership voted 61 to 46 to recommend Disapproval. Therefore, we support the Assembly’s action and encourage the voting membership at the joint ICC Annual Conference to do the same by voting for Disapproval of this code change.

Committee Reason: Based on the proponent’s published reason and intent to allow two story Group E buildings to be of unlimited area. This code change will eliminate the arbitrary restriction on area increases when the open space is between 30 feet and 60 feet. Because of the W/30 portion of the equation, it is a straight line relationship, allowing an increase up to a 150% increase when the open space is virtually at the 60 feet threshold for unlimited area buildings. There is nothing magic about the difference between 59 feet and 60 feet that justifies restricting a building to a 75% area increase when the next foot will allow it to be unlimited. This change will fill in the triangle making the increases for frontage logical and appropriate.

Committee Action: Approved as Modified

Modify proposal as follows:

**506.2.1 (Supp) Width limits.** W must be at least 20 feet (6096 mm) and the quantity W divided by 30 shall not exceed 1.0. For one-story buildings which are Group A-4, or one- or two-story buildings of Group B, E, F, M or S occupancies, W divided by 30 shall not exceed 2.0.

Committee Reason: Based on the proponent’s published reason and intent to allow two story Group E buildings to be of unlimited area.

Assembly Action: Disapproved

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted and an assembly action was successful.

Public Comment:

John Valiulis, P.E.-President, representing Alliance for Fire and Smoke Containment and Control (AFSCC), requests Disapproved.

Commenter’s Reason: We believe this code change should be Disapproved. In our opinion, it is not entirely clear as to what it is intended to accomplish regarding the modification for the value of W. During the testimony on this item at the Public Hearings held in Pittsburgh, PA., the proponent indicated that this was an attempt to allow a credit to be given for open space frontage of buildings where the open space is more than 30’ but less than 60’ in width. That bridges the gap between buildings treated in accordance with this presumably the intent is to apply the allowable increase in W to those building that would be allowed to be unlimited area by Section 507.2 except for the fact that they could not provide the necessary 60’ of open space. Yet, Section 507.2.4 Reduced Open Space will allow the required 60’ open space to be reduced to 40’ for up to 75% of the perimeter of the building when certain criteria are satisfied. In our opinion, this provides more than adequate flexibility for both the building owners and designers desirous of taking advantage of the unlimited area provisions of the code.

Nevertheless, this code change is still not appropriately written if that is the intent of the proponent. Even as amended by the Committee, this code change will still allow for a 2-story Group E Occupancy to qualify for this additional increase in W even though 2-story unlimited area Group E buildings are not allowed by Section 507.2. Also, the Group E buildings are required to meet certain other criteria including special egress arrangements and are limited to certain types of construction by Section 507.7. Furthermore, there is no requirement that any of these occupancies listed be provided with an automatic sprinkler system throughout which is clearly specified in Section 507.2, as well as in Sections 507.3 and 507.7, all of which allow for unlimited area buildings when a minimum 60’ of open space is provided around the entire building perimeter and the building is protected throughout with an automatic sprinkler system.

Another aspect of this proposed code change that disturbs us is the fact that this will allow the tabular areas in Table 503 to be increased by up to 150% as compared to the present limit of 75% for a minimum 30’ width of open spaces provided around the entire building perimeter. Since the allowable areas in the IBC are already excessive as compared to the three model building codes from which the new height and area limits were derived, this would only compound that problem by allowing even larger areas for the same type of construction for a given occupancy. We do not believe that such an increase is justified because there is no fire experience to base it on.

We should also point out that this code change was somewhat controversial since the Committee split on the vote for Approved as Modified by a vote of 9 in favor and 7 opposed. A subsequent assembly motion for Disapproval was made and the membership voted 61 to 46 to recommend Disapproval. Therefore, we support the Assembly’s action and encourage the voting membership at the joint ICC Annual Conference to do the same by voting for Disapproval of this code change.
INTERNATIONAL BUILDING CODE - MEANS OF EGRESS

**E1-02**

1002.1 (IFC 1002.1)

*Proposed Change as Submitted:*

**Proponent:** Ed Schultz, Code Consultants, Inc.; representing International Council of Shopping Centers/International Mass Retail Association

**Revise as follows:**

1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXIT ACCESS. That portion of a means of egress system that leads from any occupied portion of point in a building or structure to an exit.

**Proponent’s Reason:** The additional change in wording is to coordinate with the current sections of the code which use the terms “portions” or “areas” instead of “a point” such as Section 1004.3.1, 1005.2.1, 1005.3.5, 1008.7 and 1003.2.1. This change will facilitate consistency in the code including the proposed change to the definition of Means of Egress.

**Committee Action:** Approved as Submitted

**Committee Reason:** The phrase “from any occupied portion in a building” is correct and an improvement in the definition of EXIT ACCESS.

**Assembly Action:** No Motion

*Individual Consideration Agenda*

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Kermit C. Robinson, City of Portland Oregon, Oregon Building Officials Association, requests Disapproved.

**Commenter’s Reason:** The change will result in inconsistent application of the requirements for means of egress and exit access. The current definitions are very clear in stating “any occupied point” in a building. This tells all code users that exit access and the means of egress needs to be considered from wherever occupants of the building may be. Changing the definition to “portion of a building” will allow individual and inconsistent interpretations of where exit access and the means of egress begin. The designer could say my exit access is from this portion of the building which is a group of 5 rooms. The building official could say the exit access starts at the portion of the building defined by this room. The plans examiner could say exit access starts at each row of seats in the lower part of the auditorium. Each “point” is correct and will lead to consistent application of the code. See companion comment on E2-02.

**E2-02**

1002.1 (IFC 1002.1)

*Proposed Change as Submitted:*

**Proponent:** Ed Schultz, Code Consultants, Inc.; representing International Council of Shopping Centers/International Mass Retail Association

**Revise as follows:**

1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

MEANS OF EGRESS. A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of point in a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.

**Proponent’s Reason:** This change in wording is to coordinate with other provisions of the code which use the terms portions or areas instead of a point such as Sections 1004.3.1 - Occupied Portions, 1005.2.1 - Area, 1005.3.5 - Portion, 1008.7 - Occupied Portion, 1003.2.1 - Portions. This change will facilitate consistency in the code and will clarify that means of egress must be provided from the occupied portions of a building but not from areas which are not occupied such as inside of mechanical shaft etc., which are by definition points within a building.

**Committee Action:** Approved as Submitted

**Committee Reason:** The change to the definition for MEANS OF EGRESS facilitates consistency in the code terminology.

**Assembly Action:** No Motion

*Individual Consideration Agenda*

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Kermit C. Robinson, City of Portland Oregon, Oregon Building Officials Association, requests Disapproved.

**Commenter’s Reason:** The change will result in inconsistent application of the requirements for means of egress and exit access. The current definitions are very clear in stating “any occupied point” in a building. This tells all code users that exit access and the means of egress needs to be considered from wherever occupants of the building may be. Changing the definition to “portion of a building” will allow individual and inconsistent interpretations of where exit access and the means of egress begin. The designer could say my exit
access is from this portion of the building which is a group of 5 rooms. The building official could say the exit access starts at the portion of the building defined by this room. The plans examiner could say exit access starts at each row of seats in the lower part of the auditorium. Each “point” is correct and will lead to consistent application of the code. See companion comment on E1-02.

E5-02
1003.2.2 (IFC 1003.2.2)

Proposed Change as Submitted:

Proponent: Gregory R. Keith, Professional heuristic Development; representing The Boeing Company

Revise as follows:

1003.2.2 Design occupant load. In determining means of egress requirements, the number of occupants for whom means of egress facilities shall be provided shall be established by the largest number computed in accordance with Sections 1003.2.2.1 through 1003.2.2.3 this section. Where occupants from accessory areas egress through a primary space, the calculated occupant load for the primary space shall include the total occupant load of the primary space plus the number of occupants egressing through it from the accessory area.

1003.2.2.1 Actual number. The actual number of occupants for whom each occupied space, floor or building is designed.

1003.2.2.2 1003.2.2.1 Number by Table 1003.2.2.2. Areas without fixed seating. The number of occupants computed at the rate of one occupant per unit of area as prescribed in Table 1003.2.2.2 1003.2.2.1. For areas without fixed seating, the occupant load shall not be less than that number determined by dividing the floor area under consideration by the occupant per unit of area factor assigned to the occupancy as set forth in Table 1003.2.2.1.

| TABLE 1003.2.2.2 1003.2.2.1 |
| MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT |
| (Remainder of table unchanged) |

1003.2.2.3 Number by combination. Where occupants from accessory spaces egress through a primary area, the calculated occupant load for the primary space shall include the total occupant load of the primary space plus the number of occupants egressing through it from the accessory space.

1003.2.2.4 Increased occupant load. The occupant load permitted in any building or portion thereof is permitted to be increased from that number established for the occupancies in Table 1003.2.2.2 1003.2.2.1 provided that all other requirements of the code are also met based on such modified number and the occupant load shall not exceed one occupant per 5 square feet (0.47 m²) of occupiable floor space. Where required by the building official, an approved aisle, seating or fixed equipment diagram substantiating any increase in occupant load shall be submitted. Where required by the building official, such diagram shall be posted.

Committee Action: Disapproved

Committee Reason: The actual occupant load is needed for occupancies which are not specifically listed in the occupant load Table 1003.2.2.2 of the code. It is also needed for conditions where the actual occupant load is greater than indicated in the occupant load table. The change would introduce a new concept of primary space into the design occupant load section, which is confusing. The code official would be less likely to grant a modification to the occupant load if the actual occupant load criteria were deleted.
Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory R. Keith, Professional Heuristic Development, representing The Boeing Company, requests Approved as Modified by this comment.

Modify the current text as follows:

1003.2.2 Design occupant load. In determining means of egress requirements, the number of occupants for whom means of egress facilities shall be provided shall be established by the largest number computed determined in accordance with Sections 1003.2.2.1 through 1003.2.2.3 this section. Where occupants from accessory areas egress through a primary space, the calculated occupant load for the primary space shall include the total occupant load of the primary space plus the number of occupants egressing through it from the accessory area.

4003.2.2.1 Actual number. The actual number of occupants for whom each occupied space, floor or building is designed.

1003.2.2.2 Number by Table 1003.2.2.2. Areas without fixed seating. The number of occupants computed at the rate of one occupant per unit of area as prescribed in Table 1003.2.2.2. For areas without fixed seating, the occupant load shall not be less than that number determined by dividing the floor area under consideration by the occupant per unit of area factor assigned to the occupancy as set forth in Table 1003.2.2.1.

Exception: Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less that those determined by calculation, shall be permitted to be used in the determination of the design occupant load.

TABLE 1003.2.2.21
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT
(remainder of table to remain unchanged)

4003.2.2.3 Number by combination. Where occupants from accessory spaces egress through a primary area, the calculated occupant load for the primary space shall include the total occupant load of the primary space plus the number of occupants egressing through it from the accessory space.

1003.2.2.4 Increased occupant load. The occupant load permitted in any building or portion thereof is permitted to be increased from that number established for the occupancies in Table 1003.2.2.21 provided that all other requirements of the code are also met based on such modified number and the occupant load shall not exceed one occupant per 5 square feet (0.47 m²) of occupiable floor space. Where required by the building official, an approved aisle, seating or fixed equipment diagram substantiating any increase in occupant load shall be submitted. Where required by the building official, such diagram shall be posted.

Renumber remaining subsections.

Commenter’s Reason: The primary purpose of the original proposal was to eliminate the unenforceable circular reference currently contained in Section 1003.2.2. In the original proposal, the Section 1003.2.2.1 “actual number” provision was eliminated in its entirety. The reason for this was that the actual number provision is, for all intents and purposes, a legally moot option. Inasmuch as the current requirement specifies that the occupant load is established by the largest number computed in accordance with Sections 1003.2.2.1 through 1003.2.2.3, an actual occupant load less than that determined in accordance with Section 1003.2.2.2 could never be used. Actual occupant loads larger than those determined in accordance with Section 1003.2.2.2 are permitted based on the provisions of Section 1003.2.2.4—increased occupant load.

During testimony on the proposal in Pittsburgh, several individuals spoke to the need of retaining the actual occupant load provisions. A number of examples were offered where lesser occupant loads than those determined based on Table 1003.2.2.2 were appropriate. Given the specific subsection references currently contained in Section 1003.2.2, at this time the only legal way to allow for lesser occupant loads would be to formally recognize the condition as an alternate design under the provisions of Section 104.11.

The modification proposed in this public comment is to reintroduce the actual occupant load as an exception to the fundamental procedure for the determination of design occupant load. The proposed exception would require discretionary approval by the building official to ensure that no unsafe means of egress for building occupants occurs. It allows the building official to be accommodating by recognizing the merit of the specific design while maintaining control of that design. The building official may want to create specific conditions for approval such as the requirement that if the actual occupant load is increased at some future date, the means of egress system would be appropriately redesigned.

This proposed modification retains the flexibility intended in the existing provision while eliminating the legal dilemma posed by the present language. It is imperative that the IBC properly expresses its technical intentions, especially in a section that serves as the fundamental basis for the design of a means of egress system. The approval of this modified proposal will greatly assist code users in the proper determination of means of egress design occupant loads in the 2003 Edition of the International Building Code.
1005.3.2 are permitted to be considered part of an accessible means of egress and the minimum clear width of 48 inches (1219 mm) between handrails and the area of refuge are not required.

2. The clear width of 48 inches (1219 mm) between handrails and the area of refuge are not required at exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

3. The clear width of 48 inches (1219 mm) between handrails is not required for enclosed exit stairways accessed from a horizontal exit.

4. Areas of refuge are not required at exit stairways serving open parking garages.

**Proponent’s Reason:** This is to clarify that the unenclosed exit stairs can be constructed without the area of refuge and without the 48 inches clear between handrails. The current language is unclear as to what the exception applies.

**Committee Action:** Disapproved

**Committee Reason:** The proposal could affect some requirements that are not addressed in the reason statement. The current exception relates to the stair enclosure requirement. If the proposal were approved, unenclosed stairways could be equated to those in sprinklered facilities.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Gene Boecker, Code Consultants, Inc. (CCI), requests Approved as Modified by this comment

Modify the current text as follows:

**Proposed Change as Submitted:**

1003.3.1.8 (IFC 1003.3.1.8)

Proposed Change as Submitted:

**Proponent:** William L. Warren, North Carolina Division of Facility Services; representing North Carolina Division of Facility Services, Construction Section

**Revise as follows:**

1003.3.1.8 (Supp) Locks and latches. Egress doors shall be readily openable from the egress side without the use of a key or special knowledge or effort.

**Exceptions:**

1. thru 4. (no change)

5. Door-locking arrangements shall be permitted in Group I-2 where the clinical or security needs of the patients require specialized locking measures for their safety or the safety of others, provided keys are carried at all times by all staff that are responsible for the evacuation of the occupants within the locked building or locked unit(s).

**Proponent’s Reason:** Locking arrangements are often required by Group I-2 facilities to protect certain patients from harm whether from themselves or others. Psychiatric, suicidal and self-destructive patients must be housed in secured facilities as necessary for proper care and treatment. Hospital nurseries require strong security measures to preclude the theft of babies. In that the IBC does not allow the locking of doors in the path of egress in Group I-2 facilities, Section 1003.3.1.8 needs to be amended to allow the locking of those doors based on the clinical or security needs of the patients. Note: The North Carolina Building Code Council has adopted the 2000 Edition of the IBC with this amendment with an effective date of December 31, 2001.
There is ample documentation to show that elopement is a much greater safety hazard than fire. The code should provide alternatives that allow those responsible for the safety of patients to be able to adequately address all safety hazards. Many other national standards have permitted the locking of doors based on the clinical needs of the patients without any resultant known injuries or deaths to the patients.

There is ample documentation to show that elopement is a much greater safety hazard than fire. The code should provide alternatives that allow those responsible for the safety of patients to be able to adequately address all safety hazards. Many other national standards have permitted the locking of doors based on the clinical needs of the patients without any resultant known injuries or deaths to the patients.

E29-02
1003.3.1.8.4 (IFC 1003.3.1.8.4)

Proposed Change as Submitted:

Proponent: John Morgan, Missouri Association of Building Officials and Inspectors

Committee Action: Disapproved

Committee Reason: The proposed exception would require all staff to have a key. In some instances it is likely that a key would not be available when needed in an emergency situation.

Assembly Action: No Motion

Public Comment:


Commenter’s Reason: This issue is of significant concern for those responsible for the safeguarding of residents with challenging clinical needs such as Alzheimer’s. These occupants are incapable of self-preservation and should only be evacuating with the assistance of a trained staff person. This staff person would have the necessary key or knowledge to unlock any doors during an emergency. The likelihood that keys would not be available during an emergency is negligible as keys are plentiful and can be easily reproduced. One of the defining characteristics of a health care occupancy is the high number of trained staff available to assist not only on routine requirements, but also during emergencies. This is an important factor and should be considered.

The approach of locking certain doors in the manner described in the proposal is permitted in many jurisdictions and there have been no documented cases where these locked doors have contributed to an injury or fatality during a fire in a sprinklered health care occupancy. However, there are many documented situations where undetected and preventable elopement (wandering) of patients has led to injuries and death. Permitting the locking arrangement described in proposal E27-02 does not provide any tangible decrease in safety from fire, while significantly raising the abilities of medical staff to protect residents from hazards that are significantly more commonplace.

Time delay locks are not appropriate and do not work well in Alzheimer’s units because patients make no connection between activating a time delay lock and the resulting alarm. In many cases, the time delay locks get disconnected or worse get replaced with other types of locks after the building has been occupied. Providing a safe alternative to time delay locks is a prudent action to take.

There is ample documentation to show that elopement is a much greater safety hazard than fire. The code should provide alternatives that allow those responsible for the safety of patients to be able to adequately address all safety hazards. Many other national standards have permitted the locking of doors based on the clinical needs of the patients without any resultant known injuries or deaths to the patients.

Revise as follows:

1003.3.1.8.4 Stairway doors. Interior stairway means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. Stairway discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.11.
3. In stairways serving not more than four stories, doors are permitted to be locked from the side opposite the egress side, provided they are openable from the egress side.

Proponent’s Reason: This code requirement creates a hazardous condition in situation of fighting fires. Access by the fire department is critical during fire fighting operations. Having a lock on the door preventing fire fighters from entering the area will slow fire fighting efforts and rescue efforts thereby jeopardizing the safety of the occupants. Recognizing that security is a concern we believe that safety is a greater concern. The code official does have the authority to look at equivalences when dealing with highly sensitive and secure areas and it should be left up to the code official to make those decisions on a case by case basis.

Committee Action: Disapproved

Committee Reason: The capability to lock the door from the outside is needed for security. The International Fire Code requires a lock box where keys would be available for the fire service.

Assembly Action: No Motion

Public Comment:

David J. Thomas, P.E., Fairfax County Fire & Rescue, requests Approved as Submitted.

Commenter’s Reason: E29-02 should be approved as originally submitted. Committee action for disapproval did not consider completely the time delay inherent with retrieving, identifying and distributing keys from a lock box.

Buildings typically have multiple stairways, all of which may be locked for security. No objection is taken to security needs. Time for distribution of multiple keys to multiple firefighters for several stairs in a building is too long, and will delay necessary rescue operations. Single-point, key-operated stair door unlock override is needed. The override switch at the main building entrance will be operated by the incident commander. This avoids time delays in key distribution and key use by firefighters in the stairwells themselves.
1003.3.2.3 Automatically operated vehicular gates. Automatic operators used on vehicular gates shall meet the applicable requirements of UL 325. Such operators shall be labeled by an approved agency, with such labeling showing the name of the manufacturer and the name of the third-party inspection agency. Where public means of egress is permitted, a separate pedestrian means of egress shall be provided within 25 feet (7.6 m) of an automatically operated vehicular gate. Automatically operated vehicular slide gates shall be guarded or screened from the bottom of the gate to a minimum of 48 inches (1220 mm) above the ground to prevent a 2 1/4 inch (57 mm) sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers when the gate is in the open position. Such gates shall also have guarding around all exposed rollers.

Proponent’s Reason: Since 1985, the Consumer Product Safety Commission has received reports of 32 deaths related to automatically operated vehicular gates. Many of the deaths are from entrapment between the moving gate and a stationary object. Data from the National Electronic Injury Surveillance System (NEISS) estimates that there are approximately 2,000 people treated annually in hospital emergency rooms due to injuries in such gates. Many of these injuries are serious, involving amputations, broken arms and broken legs.

CPSC staff previously submitted a similar code change proposal addressing the subject in question. This code change proposal was designated as E136-99 and was considered during the 1999 code development cycle. A proposal submitted for the 2000 code development cycle was withdrawn when we learned that UL 325 would not be recognized as an American National Standard in time for the completion of that code development cycle. UL 325 was subsequently designated as an American National Standard on June 11, 2001.

In consideration of comments made on E136-99 by the Means of Egress Committee, by the ICC staff, and via public testimony, CPSC staff submits the following.
1. UL 325-2001 has now been recognized by ANSI as an American National Standard.
2. The provisions of UL 325 that apply to gate operators (section 30A) and automatically operated vehicular gates (Section 51.8) are written in mandatory language.
3. Subjective language has been removed from the code change proposal with respect to E136-99.
4. A separate section for automatically operated vehicular gates has been created through the current proposal.

Rationale behind the provision being proposed is as follows:
- UL 325, entitled “Door, Drapery, Gate, Louver and Window Operators and Systems,” contains provisions applying to gate operators along with various components of an automated vehicular gate system.
- The language being proposed describing “labeling by an approved agency” is consistent with language used throughout the IBC for other building products. It is common practice for many gate operator manufacturers to label their products to show compliance with UL 325.
- Instructional requirements in UL 325 as applying to automated vehicular gate systems require that a separate pedestrian entrance be provided. We have included “where public means of egress is permitted” due to the fact that, in some instances due to security related reasons, pedestrian access in the vicinity of vehicular access may not be allowed in some applications. We chose 25 feet as a reasonable limitation for pedestrian access to allow such access to be located a safe distance from the operation of the gate while allowing for visible pedestrian access proximity to the vehicular access location.
- Guarding or screening of automated vehicular access gates is to prevent an individual from “reaching through” the gate to operate the system. “Reach through” has been recognized as a leading safety concern associated with automated vehicular gate operation.
- Guarding of exposed rollers is to help prevent pinch-related injuries. This is another instructional-type requirement in UL 325 as applying to automated vehicular gate systems.

Analysis: The document being proposed is UL 325 dated June, 2001. As indicated in the reason statement, the applicable requirements addressed in the proposed code change are written in mandatory language and comply with Section 3.6 of the ICC Code Development Process for the International Codes.

Committee Action: Disapproved

Committee Reason: The proposed text does not relate to means of egress. It should be proposed for another location, perhaps in Chapter 31. Also the proposed phrase “public means of egress” is a new term that has not been defined.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joseph R. Hetzel, P.E., Technical Director, representing Door & Access Systems Manufacturers Association (DASMA), requests Approved as Modified by this comment.

Modify proposal as follows:

1003.3.2.3 Automatically operated vehicular gates. Automatic operators used on vehicular gates shall meet the applicable requirements of UL 325. Such operators shall be labeled by an approved agency, with such labeling showing the name of the manufacturer and the name of the third-party inspection agency. Where public means of egress is permitted, a separate pedestrian means of egress shall be provided within 25 feet (7.6 m) of an automatically operated vehicular gate. Automatically operated vehicular slide gates shall be guarded or screened from the bottom of the gate to a minimum of 48 inches (1220 mm) above the ground to prevent a 2 1/4 inch (57 mm) sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers when the gate is in the open position. Such gates shall also have guarding around all exposed rollers.
SECTION 3110
AUTOMATICALLY OPERATED VEHICULAR GATES

3110.1 General. Automatically operated vehicular gates shall comply with the requirements of this section and other applicable sections of this code.

3110.2 Automatic operators. Automatic operators used on vehicular gates shall meet the applicable requirements of UL 325. Such operators shall be labeled by an approved agency, with such labeling showing the name of the manufacturer and the name of the third-party inspection agency.

3110.3 Separate pedestrian access. Where pedestrian access is not restricted, separate pedestrian access shall be provided within 25 feet (7.6 m) of an automatically operated vehicular gate.

3110.4 Automatically operated vehicular slide gates. Automatically operated vehicular slide gates shall be guarded or screened from the bottom of the gate to a minimum of 48 inches (1220 mm) above the ground to prevent a 2 ½ inch (67 mm) sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers when the gate is in the open position. Such gates shall also have guarding around all exposed rollers.

Commenter’s Reason: Committee reasoning for disapproval of E 34-02 was that the proposed text did not relate to means of egress, and should be proposed for another location in the code. The Committee suggested Chapter 31 for the location of the proposal. In addition, the Committee noted that the phrase “public means of egress” was a new term proposed that had not been defined.

Door & Access Systems manufacturers Association (DASMA) supports CPSC efforts to incorporate, into the IBC, provisions governing automatically operated vehicular gates. Therefore, taking into consideration the Committee reasoning for disapproval of E 34-02, DASMA requests that the proposal be “approved as modified”, noting the following:

1. The format has been altered, and slightly editorialized, for inclusion in Chapter 31 as suggested by the Committee.
2. “Pedestrian means of egress” has been changed to “pedestrian access” for editorial clarification.
3. The “separate pedestrian access” provision is intended to apply where such access is not restricted due to security concerns.
4. The only substantive modification is to delete “where public means of egress is permitted”, since that phrase is not necessary within the context of pedestrian access.

E36-02
1003.3.4 (IFC 1003.3.4)

Proposed Change as Submitted:

Proponent: William W. Stewart, FAIA, Stewart Schaberg/Architects LLC

Revise as follows:

1003.3.4 Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the required width of stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed 48 inches (1219 mm) where the stairway has a straight run.

Exceptions: (No change)

Proponent’s Reason: Current text works fine for the average stair, but if the architect chooses to design a stair wider than required there is no reason for requiring the landing to be that wider width. Monumental stairs are a good example. Table 1003.2.3 recognizes that people move faster on level surfaces, so limiting the flat landing width to the width determined by movement of people on stairs will not create a problem. Even with this change the landing will be wider than the stairs because there is never a projecting handrail on the end wall of the stair.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason. The proposal provides for such things as standpipes to be located in a landing provided that the remaining width is adequate for the number of occupants using the stairway.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:


Commenter’s Reason: By inserting the word “required” as proposed in Proposal E36-02, the Code will allow the stair width to reduce at a landing. If the actual width of the stair is greater than the required width, the proposed new language would allow the landing to be narrower than the stair. This could result in a congested flow on the stair as one approaches the landing. During the Public Hearing, the proponent argued that the change was necessary to address items such as standpipe hose connections. However, standpipe hose connections can be located so as to not project into the required width of the landing. In addition, the proponent argues that landings will be without handrails and therefore the landing is wider anyway. While this assumption is not true in all instances, the absence of a handrail may not have any impact on the speed of travel. Since handrails are permitted to project into the clear width, due to anthropometric data for adults, the absence of a handrail will not increase the effective width of the landing and therefore will not increase the speed of travel on the landing.

Public Comment 2:

Kermit C. Robinson, City of Portland Oregon, representing, Oregon Building Officials Association, requests Disapproved.

Commenter’s Reason: The change will result in poorly designed and dangerous exit stairways. This provision would allow a design where a stairway, wider than required, could narrow at the landing to the minimum required width. The result is the same as if you put an hourglass in the middle of your egress system. While the design may be adequate to meet standards – the design creates a bottle neck at the landing. People when using a stairway don’t care what the required width is, they just use the stair. If they need or use the handrail in
descending a stairway, and if the landing is narrower than the stairs, the handrail and their path will have to jog. Stair users shouldn’t be forced to change direction unless the stairway changes direction. Handrails are suppose to extend in the direction of stair travel onto the landing, if the edge of stairway/landing jogs at that point the purpose of the handrail extension is defeated. People with vision impairments will take the jog in the handrail as an indication that the direction of the stairway is changing and be may suddenly try to walk across a stair tread, thinking it is the landing.

E38-02
1004.2.2.1 (IFC 1004.2.2.1)

Proposed Change as Submitted:

Proponent: Gilbert Gonzales, Murray City Corporation; representing Utah Chapter of ICBO

Revise as follows:

1004.2.2.1 (Supp) Two exit or exit access doorways. Where two exits or exit access doorways are required from any portion of the exit access, the exit doors or exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access doorways. Interlocking or scissor stairs shall be counted as one exit stairway.

Exceptions:

1. Where exit enclosures are provided as a portion of the required exit and are interconnected by a 1-hour fire-resistive corridor conforming to the requirements of Section 1004.3.2, the required exit separation shall be measured along the shortest direct line of travel within the corridor.
2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the exit doors or exit access doorways shall not be less than one-fourth or one-third of the length of the maximum overall diagonal dimension of the area served.

Proponent’s Reason: The egress system is provided by the IBC is unique to this code. Much of it comes from the former three regional codes, but some are new or revised concepts. There was a good deal of discussion, balance, compromise and analysis of sprinkler trade-off during the drafting process. The reduction of separation for sprinklers to 1/3 the diagonal was the reasonable distance decided which still provided adequate remoteness balancing all other sprinkler trade-offs.

In Chapter 10 alone, the reduction of requirements for fire sprinklers include egress width, accessible egress, accessible stairways, areas of refuge, exit access separation, travel distance, common path, dead end corridors, temperature rise for exit enclosure doors, exterior stairway protection, exit discharge through buildings, emergency escape and rescue openings. Is it prudent to allow such a dramatic reduction of separation when carefully considering all trade-off factors?

Committee Action: Disapproved

Committee Reason: No data is in the reason statement and none was presented at the hearings that justify the proposed change to the spacing of exit or exit access doorways.

Assembly Action: No Motion

Individual Consideration Agenda

This item is in the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gilbert Gonzales, Murray City Corp., representing, Utah Chapter ICC, requests Approved as Submitted.

Commenter’s Reason: In the 2001 cycle, the separation requirements in sprinklered building were reduced from 1/3 to 1/4 the diagonal. The reasoning was one of the codes had permitted 1/4 prior to the IBC. There little consideration was given to the balance of sprinkler trade-off achieved during the drafting process. Of all concepts regulating egress, availability of an alternative means escape is the most basic. The FEMA World Trade Center report emphasizes the importance of exit spacing.

Much has been said about the IBC putting all of its eggs in the fire sprinkler basket. In Chapter 10 alone, the reduction of requirements for fire sprinklers include egress width, accessible egress, accessible stairways, areas of refuge, exit access separation, travel distance, common path, dead end corridors, temperature rise for exit enclosure doors, exterior stairway protection, exit discharge through buildings, emergency escape and rescue openings. Is it prudent to allow such a dramatic reduction of separation when carefully considering all trade-off factors?

The following diagram illustrates an allowed condition, unless the committee is overturned.
**E39-02**

1004.2.2.2 (IFC 1004.2.2.2)

**Proposed Change as Submitted:**

**Proponent:** Gilbert Gonzales, Murray City Corporation; representing Utah Chapter of ICBO

**Revise as follows:**

1004.2.2.2 (Supp) Three or more exits or exit access doorways. Where access to three or more exits is required, at least two exit doors or exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the area served measured in a straight line between such exit doors or exit access doorways. Additional exits or exit access doorways shall be arranged a reasonable distance apart so that if one becomes blocked, the others will be available.

**Exception:** Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of at least two of the exit doors or exit access doorways shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served. Additional exits or exit access doorways shall be arranged a reasonable distance apart so that if one become blocked, the others will be available.

**Proponent's Reason:** Proposal repeats the last sentence of the first paragraph in the exception which addition the 2001 cycle. The position of the new exception implies it is acceptable to have all three or four required exits located within a very small area equal to only 1/3 of the diagonal of the entire area served in sprinklered buildings. The proposed language clarifies reasonable separation of the 3rd and/or 4th exit or exit access doorway is also required in sprinklered buildings.

**Committee Action:** Disapproved

**Committee Reason:** The proposed text for the exception is already in the charging paragraph and need not be repeated. The door spacing requirement in the last sentence of the charging paragraph also applies to a sprinklered building.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Gilbert Gonzales, Murray City Corp., representing, Utah Chapter ICC, requests Approved as Modified by this comment.

Modify the current text as follows:

1004.2.2.2 (SUPP) Three or more exits or exit access doorways. Where access to three or more exits is required, at least two exit door or exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the area served measured in a straight line between such exit doors or exit access doorways. Additional exits or exit access doorways shall be arranged a reasonable distance apart so that if one become blocked, the others will be available.

**Exception:** Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of at least two of the exit doors or exit access doorways shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served. Additional exits or exit access doorways shall be arranged a reasonable distance apart so that if one become blocked, the others will be available.

**Commenter's Reason:** The exception was added in the 2001 cycle. The location of new exception causes it to apply to the entire paragraph allowing all three or four required exits to be located within a very small area equal to only 1/3 of the diagonal of the entire area served in sprinklered buildings. It is doubtful the intent was to allow a condition as illustrated by the attached diagram. The proposed language clarifies reasonable separation of the 3rd and/or 4th exit or exit access doorway.
is also required in sprinklered buildings.

Group A-2
Occupant Load 1,042
4 Exits Required within 59'

E42-02
1004.2.4 (IFC 1004.2.4)

Proposed Change as Submitted:

**Proponent:** Gilbert Gonzales, Murray City Corporation; representing Utah Chapter of ICBO

Revise as follows:

1004.2.4 (Supp) Exit access travel distance. Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story to the entrance to an exit along the natural and unobstructed path of egress travel, shall not exceed the distances given in Table 1004.2.4.

Where the path of exit access includes unenclosed stairways or ramps within the exit access, the distance of travel on such means of egress components and on stories connected by such unenclosed stairways shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

**Exception:** Travel distance in open parking garages is permitted to be measured to the closest riser of open stairs.

**Proponent’s Reason:** A clarification that travel distance is generally measured within a story was added in the 2001 cycle. Exception 8 to Section 1005.3.2 allows an unenclosed stairway to be counted as an exit in certain cases. This proposal further clarifies that when an unenclosed stairway is a required exit, the travel distance measurement does not stop at the stair, but includes travel on stories connected by the unenclosed stairway opening.

**Committee Action:** Disapproved

**Committee Reason:** The application of the proposed change is not clear. It does appear that how travel distance should be measured on a stairway needs to be further clarified.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Sarah A. Rice, representing Schirmer Engineering Corp., requests Approved as Modified by this comment.

Modify proposal as follows:

1004.2.4 (Supp) Exit access travel distance. Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story to the entrance to an exit along the natural and unobstructed path of egress travel, shall not exceed the distances given in Table 1004.2.4.
Where the path of exit access includes unenclosed stairways or ramps within the exit access, the distance of travel on such means of egress components on stories connected by such unenclosed stairways shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

**Exceptions:**

1. Travel distance in open parking garages is permitted to be measured to the closest riser of open stairs.
2. Where an exit stair is permitted to be unenclosed in accordance with Exception 8 or 9 of Section 1005.3.2, the travel distance shall be measured from the most remote point within a building to an exit discharge.

Commenter’s Reason: The proposed modification is in response to the committee’s reason which stated that “how travel distance should be measured on a stairway needs to be further clarified.”

There appears to be some confusion with regard to the measurement of exit access travel distance. And in particular when measuring exit access travel down an exit stair.

First it should be noted that the concept of measuring exit access travel distance down an “exit stair” is contrary to the fundamental concept of exit access. Exit access stops when one reaches “exit.” Therefore exit access travel distance stops at the point one reaches an exit. Whether or not an exit is “enclosed” is a separate provision in the code and not tied to the measurement of exit access travel distance.

Why this becomes important because the Exceptions 8 and 9 contained in Section 1005.3.2 were incorporated into the code with the assumption that though these are exits, exit access travel distance would continue to be measured down the exit stair. But that is not how a literal application of the IBC would work. Therefore as this was the basis for how the provisions worked in the Uniform Building Code it is appropriate that the IBC provision work the same way.

Without the proposed language, a literal interpretation would have the exit access travel distance measured to the top of an unenclosed exit stairway and the distance from the top of the unenclosed exit stair to the exit discharge would not be regulated.

**E46-02**

1004.3.1.1 (IFC 1004.3.1.1)

*Proposed Change as Submitted:*

**Proponent:** Lawrence G. Perry, AIA, BOMA International

Revised as follows:

1004.3.1.1 Public areas Group B and M. In public areas of Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1003.2.3 for the occupant load served, but shall not be less than 36 inches (914 mm). Where seats, tables, furnishings, displays and similar fixtures or equipment are placed on only one side of the aisle and 44 inches (1118 mm) where such fixtures or equipment are placed on both sides of the aisle.

**E53-02**

1004.3.2.4 (IFC 1004.3.2.4) (IMC 601.2)

*Proposed Change as Submitted:*

**Proponent:** Robert Lulloff, Hilton Hotels Corporation

1. Revise as follows:

IBC 1004.3.2.4 (Supp) Air movement in elements. Exit access corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts or plenums.
Exceptions:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m²) or less in area, utilization of corridors for conveying return air is permitted.
4. In multifamily dwellings, hotels and similar occupancies, this requirement shall not prohibit the use of a corridor as a source of make-up air through normal leakage around doors for external exhaust fans in kitchens, appliances, bathrooms and toilets.

Modify proposal as follows:

IMC [B] 601.2 (Supp) Air movement in egress elements. Exit access corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

Exceptions:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m²) or less in area, utilization of corridors for conveying return air is permitted.
4. In multifamily dwellings, hotels and similar occupancies, this requirement shall not prohibit the use of a corridor as a source of make-up air through normal leakage around doors for external exhaust fans in kitchens, appliances, bathrooms and toilets.

Committee Reason: There is no detail as to the pressure requirements in a corridor to keep it clear of smoke. Without that, the corridor may not be safe for egress.

Exception 1 of Section 1004.3.2.4 already addresses most of the same issues in the proposal. The wording of the proposed exception includes language that is not proper code text. For example the proposal should reference Group R-1 and R-2 instead of the list of types of buildings.

Committee Action: Disapproved

Public Comment:
Gary Gorham, representing VP Gorham/Schaffler, Inc., requests Approved as Modified by this comment.

Modify proposal as follows:

IBC 1004.3.2.4 (Supp) Air movement in elements. Exit access corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts or plenums.

Exceptions:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m²) or less in area, utilization of corridors for conveying return air is permitted.
4. In multifamily dwellings, hotels and similar occupancies Group R-1 and R-2 occupancies, this requirement shall not prohibit the use of a corridor as a source of make-up air through normal leakage around doors for external exhaust fans in kitchens, appliances, bathrooms and toilets.

IMC [B] 601.2 (Supp) Air movement in egress elements. Exit access corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

Exceptions:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m²) or less in area, utilization of corridors for conveying return air is permitted.
4. In multifamily dwellings, hotels and similar occupancies Group R-1 and R-2 occupancies, this requirement shall not prohibit the use of a corridor as a source of make-up air through normal leakage around doors for external exhaust fans in kitchens, appliances, bathrooms and toilets.
around doors for external exhaust fans in kitchens, appliances, bathrooms and toilets.

**Commenter’s Reason:** The committee reason for disapproval declared that “no detail as to the pressure requirements in the corridor to keep it clear of smoke” was given. A building corridor conditioned with tempered outside air has a higher air pressure relative to an adjoining occupancy. This air pressure differential across the entry door should keep smoke generated from a fire within a hotel guest room or apartment inside the confines of the room, providing for a smoke free corridor. See attached NFPA article, paragraph 2, for information regarding most common sources of hotel fires (also located at [http://www.nfpa.org/MemberSections/lodging/articles/articles.asp](http://www.nfpa.org/MemberSections/lodging/articles/articles.asp)).

The committee also commented that Section 1004.3.2.4 already addresses most of the same issues. I agree that this is the case, but the attached interpretation (page 2) of the same prose in BOCA Section 1005.7, Exception 1, indicates otherwise. Therefore, a specific exception for this application is necessary.

**Staff Note:** The documents described in the reason statement were submitted with the public comment.

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**E65-02**

**1006.4 (IFC 1006.4)**

**Proposed Change as Submitted:**

**Proponent:** Paul Hayward, City of Farmington, UT; representing Bonneville Chapter ICBO

**Revise as follows:**

**1006.4 (Supp) Access to a public way.** The exit discharge shall provide a direct and unobstructed access to a public way.

**Exception.** Where the access to a public way cannot be provided due to site constraints and hazards along its path, and when approved by the building official, a safe dispersal area shall be provided where all of the following is met:

1. The area shall be of a size to accommodate at least 3 sq. ft. (0.28 m²) 9 sq. ft. (0.84 m²) for each person.
2. Be located on the same property at least 50' (15240 mm) away from the building requiring egress.
3. The area must be permanently maintained and identified as a safe dispersal area.
4. The area shall be provided with an unobstructed path of travel from the building.

**Proponent’s Reason:** In answer to objections from the SBCCI Means of Egress Code Action Committee, as expressed in Public Comment 2 for Code Change Proposal E48-01, approval from the building official will allow the action of denying an applicant this exception, if it cannot be successfully demonstrated that the intent of the exception is being met in good faith. Otherwise, you must permit it.

As approved in the last cycle by the membership, it is difficult to see when the current provisions will ever be used. Also, hazards, site constraints, and “safe” have not been defined. Isn’t every provision in the IBC presumed to add safety, and thus the word “safe” is not necessary? What is “safe,” anyway? There is no distinct text stating how the area is to be “identified”.

The area is increased from 3 sq. ft. per person to 9 sq. ft., due to the fact the anyone needing to use this area may indeed be there for a time and sitting or laying down might be desirable. With only a 18” by 24” area it’s pretty cramped, particularly if wearing bulky winter clothing, hold a briefcase or lap-top computer, etc. Persons generally prefer a little more “personal” space around them when not being able to leave an area at will.

The concept of a dispersal area begins to get into the realm of “performance-based” options which the IBC should start to embrace, not shrink from implementing. Designers deserve some alternatives to rigid, prescriptive provisions. Certainly the committee was correct that “the new section is a good first start for safe dispersal area provisions” but now lets make them workable. This proposal goes a long ways towards doing just that.

**Committee Action:** Disapproved

**Committee Reason:** The language “when approved by the code official” is not needed. The specified 9 square feet area is too high. The phrase “due to site constraints” should be retained.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

**Gene Boecker, representing Code Consultants, Inc. (CCI), requests Approved as Modified by this comment.**

**Modify the current text as follows:**

**1006.4 (Supp) Access to a public way.** The exit discharge shall provide a direct and unobstructed access to a public way.

**Exception.** Where the access to a public way cannot be provided due to site constraints and hazards along its path, a safe dispersal area shall be provided where all of the following is met:

1. The area shall be of a size to accommodate at least 3 sq. ft. 5 sq. ft. for each person.
2. Be located on the same property at least 50 ft. away from the building requiring egress.
3. The area must be permanently maintained and identified as a safe dispersal area.
4. The area shall be provided with a safe and unobstructed path of travel from the building.

**Commenter’s Reason:** The proponent’s original idea is valid. Since there were no less than four proposals to deal with this section, it is clear that the section needs some work to aid in it’s usability. The text above addresses the committee’s concerns. The 6 sq. ft. area is sufficient to accommodate a fairly high density of standing individuals.
as well as allow for additional room for wheelchairs and litters. It is the same number used for “standing space” in Table 1003.2.2. The language “due to site constraints” is vague at best. Contrary to the committee’s comment, it is entirely subjective and can be interpreted to mean only geographical features. Without the use of the phrase it is possible to address security concerns that are now becoming ever more prevalent in today’s society where outside gates and fences are installed to limit access and/or egress.

E74-02
1009.1 (IFC 1009.1) (IRC R310.1)

Proposed Change as Submitted:

Proponent: Richard A. Morris, National Association of Home Builders

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. Revise as follows:

SECTION 1009
EMERGENCY ESCAPE AND RESCUE

IBC 1009.1 (Supp) General. In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue in Group R as applicable in Section 101.2 and Group I-1 occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such opening shall open directly into a public street, public alley, yard or court.

Exceptions: (No change)

2. Revise as follows:

IRC R310.1 (Supp) Emergency escape and rescue openings required. Basements with habitable space and every sleeping room shall have at least one openable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public street, public alley, yard or court. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 44 inches (1118 mm) above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with Section 310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2.

Proponent’s Reason: The purpose of the proposal is to clarify that where a basement contains a bedroom, egress is only required through the bedroom: one emergency egress and rescue opening is required in each bedroom, but an additional opening is not required in other habitable space in the basement. Having egress through the bedroom provides greater protection to occupants sleeping in the bedroom than having to egress through adjoining habitable space. The bedroom door can also provide occupants sleeping in the bedroom with additional protection against fire and smoke. Moreover, furnaces and highly combustible materials are unlikely to be located in a sleeping room. Occupants in adjoining habitable space are more likely to be awake and better able to respond to an emergency than occupants in bedrooms. If doors to the bedrooms should have privacy locks on them that are locked, and occupant in the adjoining habitable space in the basement can ask an occupant in one of the bedrooms to open the door, can break through the door (interior doors with privacy locks are relatively easy to breach), or can use the basement stairs. It is extremely unlikely that egress through a bedroom would not be possible.

ITEM 1 (IBC)
Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason. The change requires each sleeping room to have a rescue opening in each basement bedroom, which is an improvement to the current text.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Irvin J. Poke, AIA, STATE OF MICHIGAN, representing DCIS Bureau of Construction Codes, requests Approved as Modified by this comment.
Modify items 1 and 2 of the proposal as follows:

1. **IBC 1009.1 (Supp) General.** In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue in Group R as applicable in section 101.2 and Group I-1 occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency escape and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Doors in the path of travel from the adjoining basement area to the emergency escape and rescue openings shall not be subject to locking. Such opening shall open directly into a public street, public alley, yard or court.

2. **IRC R310.1 (Supp) Emergency escape and rescue openings required.** Basements with habitable space and every sleeping room shall have at least one openable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Doors in the path of travel from the adjoining basement area to the emergency escape and rescue openings shall not be subject to locking. Such openings shall open directly into a public street, public alley, yard or court. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 44 inches (1118 mm) above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with Section 310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2.

**Commenter’s Reason:** The added text makes it clear that locked doors cannot impede the path of travel from a basement area adjoining a sleeping area.

**Public Comment 2**

Gilbert Gonzales, Murray City Corp., representing Utah Chapter ICC, requests items 1 and 2 Disapproved.

**Commenter’s Reason:** The reason for requiring egress windows in basements is two-fold. (1) Since basements are frequently left unfinished at initial construction, the lack of an egress window make it impossible to finish the basement at some future date with any sleeping areas included. (2) Since the building official cannot allow finishing a bedroom in a basement without an egress window, such work is frequently done without a permit, creating a host of other potential code violations. Since this requirement entered the UBC in 1988, egress windows in basements have become almost automatic—not just one egress window, but usually most or all of the windows. It has prevented many problems of permitting basement bedrooms as basements are finished off years later. This language should not be removed from the code.

E79-02

**1009 (new)**

*Proposed Change as Submitted:*

**Propponent:** Barry N. Gupton, PE, North Carolina Building Department of Insurance; representing SBCCI Means of Egress, Code Action Committee

Add new text as follows:

**SECTION 1009**

**EDUCATIONAL**

**1009.1 General.** In addition to the means of egress required by this chapter, special provisions shall be made for discharge of preschool, kindergarten, first-grade, and second grade students.

**1009.2 Preschool, kindergarten, first grade and second grade.** Rooms normally occupied by preschool, kindergarten or first grade students shall not be located with their means of egress above or below the level of exit discharge. Rooms normally occupied by second-grade students shall not be located with their means of egress more than one story above or below the level of exit discharge.

**Exception:** Rooms provided with independent means of egress shall be permitted to be located on other floor levels.

(Renumber current sections)

**Propponent’s Reason:** Preschool, kindergarten and first-grade students should not use the same means of egress stairways as older students. They are less capable of self-preservation, slower in evacuation and may obstruct the means of egress stairways for other building occupants in an emergency situation. NFPA 101-2000, Section 14.2.1.2 is cited by school planning officials and Fire Officials in their safety plans. This limitation should be included in the IBC/IFC as well.

The Committee reason for disapproval of E43-01 was clarity. This proposal adds a section in Chapter 10 for egress requirements specific to Educational occupancy.

**Committee Action:** Disapproved

**Committee Reason:** This is an occupancy issue, not a means of egress issue and thus would be better located in Chapter 4, if approved. It is questionable if this type of issue should be addressed in a model code since the grade level use of educational rooms often change. The term preschool is not a defined term in the code. The conditions which would meet the exception is not clear.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Commenter's Reason: Preschool, kindergarten and first-grade students should not use the same means of egress stairways as older students. They are less capable of self-preservation, slower in evacuation and may obstruct the means of egress stairways for other building occupants in an emergency situation. NFPA 101-2000, Section 14.2.1.2 is cited by school planning officials and Fire Officials in their safety plans. This limitation should be included in the IBC/IFC as well.

The Committee reason for disapproval of E43-01 was clarity. This proposal adds a Section in Chapter 10 for egress requirements specific to Educational occupancy.

The Committee reason for disapproval of E79-02 was that this is an operational feature and cannot be controlled by the Code because of future changes in use. There are many Code requirements that fall into this category (storage, location and quantities of hazardous materials, for example). The building must be designed with the owner's original intent in mind and these life-safety requirements should be in the Code. Future changes in use should be addressed by permit, licensing, fire inspection, etc.

There was an assembly comment that the heading should read “EDUCATIONAL GROUP E” rather than “EDUCATIONAL”. This is an editorial change, should Staff decide to modify the heading to 1008 as well for consistency.

E80-02
Chapter 10 (IFC Chapter 10)

Proposed Change as Submitted:

Proponents: Wayne Jewell, City of Southfield, MI; Ken Schoonover, KMS Associates

Co-Proponents: Jeff Shapiro, International Code Consultants, Inc.; Gene Boecker, Code Consultants, Inc.; John Terry, State of New Jersey; Shahriar Amiri, Montgomery County, MD; Jan Sokolnicki, State of Ohio; Julie Ruth, AAMA Codes and Standards Task Group; Jim Sealy, Architect; Terry Tepe, Architect; Mark Wales, Code Consultant; Dave Collins, American Institute of Architects; Dave Frable, General Services Administration; Sarah Rice, Schirmer Engineering

1. Revise the format of IBC and IFC Chapter 10 as follows:

SECTION 1001 ADMINISTRATION
1001.1 General.
1001.2 Minimum requirements.
1001.3 Maintenance.

SECTION 1002 DEFINITIONS
1002.1 Definitions.

SECTION 1003 GENERAL REQUIREMENTS
MEANS OF EGRESS

1003.1 General requirements. Applicability. The general requirements specified in this Sections 1003 through 1012 shall apply to all three elements of the means of egress system, in addition to those specific requirements for the exit access, the exit and the exit discharge detailed elsewhere in this chapter.

1003.2 System design requirements. The means of egress system shall comply with the design requirements of Sections 1003.2.1 through 1003.2.12.7.1.

(1003.2.1 Multiple occupancies - and all subsections - moved to new 1004.9)
(1003.2.2 Design occupant load - and all subsections - moved to new 1004.1 - 1004.8)
(1003.2.3 Egress width - and all subsections - moved to new 1005)

1003.2 1003.2.4 Ceiling height.

1003.3 1003.2.5 Protruding objects.
1003.3.1 1003.2.5.1 Headroom.
1003.3.2 1003.2.5.2 Free-standing objects.
1003.3.3 1003.2.5.3 Horizontal projections.
1003.3.4 1003.2.5.4 Clear width.

1003.4 1003.2.6 Floor surface.

1003.5 1003.2.7 Elevation change.

1003.6 1003.2.8 Means of egress continuity.

1003.7 1003.2.9 Elevators, escalators, and moving walks.

(1003.2.10 Exit signs - and all subsections - moved to new 1011)
(1003.2.11 Means of egress illumination - and all subsections - moved to new 1006)
(1003.2.12 Guards - and all subsections - moved to new 1012)
(1003.2.13 Accessible means of egress - and all subsections - moved to new 1007)

1003.3 Means of egress components. Doors, gates, stairways and ramps shall comply with the applicable requirements of Section 1003.

(1003.3.1 Doors - and all subsections - moved to new 1008.1)
(1003.3.2 Gates - and all subsections - moved to new 1008.2)
(1003.3.3 Stairways - and all subsections - moved to new 1009)
(1003.3.4 Ramps - and all subsections - moved to new 1010)
(1003.3.5 Turnstiles - and all subsections - moved to new 1008.3)

SECTION 1004 OCCUPANT LOAD
1004.1 4003.2.2 Design occupant load. In determining
means of egress requirements, the number of occupants
for whom means of egress facilities shall be provided
shall be established by the largest number computed in
accordance with Sections 1003.2.2.1 through 1003.2.2.3
and
1004.1.1 4003.2.2.4 Actual number.
1004.1.2 4003.2.2.2 Number by Table
1003.2.2.2.
Table 1004.1.2 Table 1003.2.2.2 Maximum floor
area allowances per occupant
1004.1.3 4003.2.2.3 Number by combination.
1004.2 4003.2.2.4 Increased occupant load.
1004.3 4003.2.2.5 Posting of occupant load.
1004.4 4003.2.2.6 Exiting from multiple levels.
1004.5 4003.2.2.7 Egress convergence.
1004.6 4003.2.2.8 Mezzanine levels.
1004.7 4003.2.2.9 Fixed seating.
1004.8 4003.2.2.10 Outdoor areas.
1004.9 4003.2.1 Multiple occupancies.

SECTION 1005 EGRESS WIDTH
1005.1 4003.2.3 Minimum required egress width.
1005.2 4003.2.3.1 Door encroachment.

SECTION 1006 MEANS OF EGRESS
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SECTION 1010 RAMPS

1010.1 Ramps. Scope. The provisions of this section shall apply to ramps used as a component of a means of egress shall conform to the provisions of Sections 1003.3.4.1 through 1003.3.4.9.

1010.2 Slope. 
1010.3 Cross slope. 
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SECTION 1011 EXIT SIGNS

1003.3.10 Exit signs. Exit signs shall comply with Sections 1003.2.10.1 through 1003.2.10.5.
1011.1 Where required. 
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SECTION 1012 GUARDS

1012.1 Guards Where required. 
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SECTION 1013 EXIT ACCESS

1013.1 General. The exit access arrangement shall comply with Sections 1013 through 1016 and the applicable provisions of Sections 1003 through 1012.

1013.2 Egress through intervening spaces.
   1013.2.1 Multiple tenants.
   1013.2.2 Group I-2.

1013.3 Common path of egress travel.

1013.4 Aisles.
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   1013.4.2 Nonpublic areas.
   1013.4.3 Seating at tables.
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1013.5 Egress balconies.
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SECTION 1014 EXIT AND EXIT ACCESS DOORWAYS

1014.1 Exit or exit access doorways required.

Table 1004.2.1 Exit access travel distance – and all subsections – moved to new 1014.1.

1014.2 Exit or exit access door arrangement – and all subsections – moved to new 1014.2)
SECTION 1015 EXIT ACCESS TRAVEL DISTANCE

1015.1 4004.2.4 Exit access Travel distance limitations.

Table 1015.1 Table 1004.2.4 Exit access travel distance.

1015.2 4004.2.4.1 Roof vent increase.

1015.3 4004.2.4.2 Exterior egress balcony increase.

SECTION 1016 CORRIDORS

4004.3.2 Corridors. Corridors shall comply with Sections 1004.3.2.1 through 1004.3.2.5.

1016.1 4004.3.2.1 Construction.

1016.2 4004.3.2.2 Corridor width.

1016.3 4004.3.2.3 Dead ends.

1016.4 4004.3.2.4 Air movement in corridors.

1016.4.1 4004.3.2.4.1 Corridor ceiling.

1016.5 4004.3.2.5 Corridor continuity.

SECTION 1017 4005 EXITS

1017.1 4005.1 General. Exits shall comply with Sections 1005 through 1022 and the applicable requirements of Sections 1003 through 1012. An exit shall not be used for any purpose that interferes with its function as a means of egress. Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge.

4005.2 Exit design requirements. The exit portion of the means of egress system shall comply with the design requirements of Sections 1005.2.1 through 1005.2.3.

1017.2 4005.3.1 Exterior exit doors.

1017.2.1 4005.3.1.1 Detailed requirements.

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SECTION 1018 NUMBER OF EXITS AND CONTINUITY

1018.1 4005.2.1 Minimum number of exits.

Table 1018.1 Table 1005.2.1 Minimum number of exits for occupant load.

1018.1.1 4005.2.1.1 Open parking structures.

1018.1.2 4005.2.1.2 Helistops.

1018.2 4005.2.2 Buildings with one exit.

Table 1018.2 Table 1005.2.2 Buildings with one exit.

1018.3 4005.2.3 Exit continuity.

1018.4 4005.2.4 Exit door arrangement.

4005.3 Exit components. Exit components shall comply with Section 1005, and the applicable requirements of

Section 1003:

(1005.3.1 Exterior exit doors – and all subsections – moved up to new 1017.2)

SECTION 1019 VERTICAL EXIT ENCLOSURES

1019.1 4005.3.2 Vertical exit Enclosures required.

1019.1.1 4005.3.2.1 Vertical enclosure exterior walls.

1019.1.2 4005.3.2.2 Enclosures under.

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1019.1.4 4005.3.2.4 Stairway floor number signs.

1019.1.5 4005.3.2.5 Smokeproof enclosures.

1019.1.5.1 4005.3.2.5.1 Enclosure exit.

1019.1.5.2 4005.3.2.5.2 Enclosure access.

(1005.3.3 Exit passageway – and all subsections – moved to new 1020)

1019.2 4005.3.4 Openings and penetrations.

1019.2.1 4005.3.4.1 Penetrations.

1019.2.2 4005.3.4.2 Ventilation.

(1005.3.5 Horizontal exits – and all subsections – moved to new 1021)

SECTION 1020 EXIT PASSAGEWAYS

1020.1 4005.3.3 Exit passageway. Exit passageways serving as an exit component in a means of egress system shall comply with the requirements of this section Sections 1005.3.3.1 through 1005.3.3.2. An exit passageway shall not be used for any purpose other than as a means of egress.

1020.2 4005.3.3.1 Width.

1020.3 4005.3.3.2 Construction.

SECTION 1021 HORIZONTAL EXITS

1021.1 4005.3.5 Horizontal exits. Horizontal exits serving as an exit component in a means of egress system shall comply with the requirements of this section Sections 1005.3.5.1 through 1005.3.5.3. A horizontal exit shall not serve as the only exit from ... (remainder unchanged).

1021.2 4005.3.5.1 Separation.

1021.3 4005.3.5.2 Opening protective.

1021.4 4005.3.5.3 Capacity of refuge.

SECTION 1022 EXTERIOR EXIT STAIRWAYS

1022.1 4005.3.6 Exterior exit stairways. Exterior exit stairways serving as an element of a required means of egress shall comply with this section Sections 1005.3.6.1 through 1005.3.6.6.

Exception: (no change).

1022.2 4005.3.6.1 Use in a means of egress.

1022.3 4005.3.6.2 Open side.

1022.4 4005.3.6.3 Side yards.
1022.5 4005.3.6.4 Location. 
1022.6 4005.3.6.5 Exterior stairway protection.

SECTION 1023 1006 EXIT DISCHARGE

1023.1 1006.1 General. 
1023.2 1006.2 Exit discharge design requirements. The exit discharge portion of the means of egress system shall comply with the applicable design requirements of Sections 1006.2.1 and 1006.2.2. 
1023.2 1006.2.2 Exit discharge capacity. 
1023.3 1006.2.2 Exit discharge location. 
1023.4 1006.3 Exit discharge components. Exit discharge components incorporated into the design of the exit discharge portion of the means of egress system shall comply with Section 1006. Exit discharge components shall be sufficiently open to the exterior so as to minimize the accumulation of smoke and toxic gases. 
1023.5 1006.3.1 Egress courts. 
1023.5.1 1006.3.1.1 Width. 
1023.5.2 1006.3.1.2 Construction and openings. 
1023.6 1006.4 Access to a public way. 

(SECTION 1007 MISCELLANEOUS MEANS OF EGRESS REQUIREMENTS – and all subsections – moved to new 1014.3 – 1014.7)

SECTION 1024 1008-ASSEMBLY

SECTION 1025 1009 EMERGENCY ESCAPE AND RESCUE

2. Revise the additional sections of the IFC as follows:

SECTION 1026 1009 MEANS OF EGRESS FOR EXISTING BUILDINGS

SECTION 1027 1011 MAINTENANCE OF THE MEANS OF EGRESS

Proponent's Reason: The purpose of this change is to revise the section numbering system and, accordingly, the format such that the topics in Chapter 10 are easier to locate for the code user. It is important that the format of Chapter 10 be consistent with the other chapters of the International Building Code and International Fire Code, which divide the component sections of each chapter into multiple sections for ease of reference. In addition, the current format of Chapter 10 results in numerous decimal points for various subsections that make code text discussions needlessly difficult.

The current format groups more than 50% of Chapter 10 into two Sections (1003 and 1004) with more than 40% of the chapter is in a single Section 1003. The result that the table of contents does not adequately describe the scope and content of the Chapter. This proposal does not revise the technical content of the Chapter but makes the frequently referenced text and provisions easier to be located.

THE TABLE OF CONTENTS FOR THE REFORMATTED CHAPTER

WOULD LIST 25 SECTIONS (VS THE CURRENT 9) TO ASSIST THE CODE USER TO EASILY LOCATE THE EGRESS REQUIREMENTS.

The first objective was to identify topics which are fundamental egress criteria and terms. These have been cast as Sections and not buried in the Chapter.

The content is generally in the same overall order and framework as the current chapter. This is seen as necessary in order to provide a smooth transition from the 2000 Edition to the 2003 Edition. For example, the specific topics are still listed under GENERAL REQUIREMENTS, EXIT ACCESS, EXITS AND EXIT DISCHARGE. Further, current sections 1003.2, 1003.3, 1004.2, 1004.3, 1005.2, 1005.3, 1006.2 and part of 1006.3 were deleted. These sections identify the following current sections as “system design requirements” or if they are as “means of egress components”. Such text is not necessary and are not compatible with the proposed format.

After the Section topics were identified, the subsections were merged under the appropriate Sections. For example, the current sections regarding GATES and TURNSTILES was combined with new Section 1008 regarding DOORS. The new Section title was changed so that the added topics could be easily located. As another example, current Section 1007 MISCELLANEOUS MEANS OF EGRESS REQUIREMENTS was combined with new Section 1014 EXIT OR EXIT ACCESS DOORWAYS since all of current Section 1007 are egress or exit door requirements.

The minor subsections that do not warrant being a Section were combined under the Section heading of “GENERAL REQUIREMENTS”.

THE FOLLOWING REFLECTS THE STATUS AND RELOCATION OF EACH OF THE CURRENT SECTIONS IN CHAPTER 10. NOT ALL SUBSECTIONS ARE SHOWN FOR CLARITY.

2000 IBC AND IFC 
CHAPTER 10 - MEANS OF EGRESS 
CURRENT AND PROPOSED RELOCATED SECTIONS

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254 2002 ICC FINAL ACTION AGENDA
Committee Action: Approved as Submitted

Committee Reason: The current numbering system makes conversations regarding the code sections and their requirements needlessly difficult. The numbering system in the proposal will make those communications easier. The numbering system in the proposal makes items easier to find and remember where they are located. A person will not need to search around within a general section to find a particular item. The items in the proposal are listed in a similar sequence as they are currently, so general means of egress, exit access, exit and exit discharge requirements are in the same order. It is more convenient for items that are commonly referenced to have their own sections that will be listed in the table of contents.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Anne Vonweller, Murray City Corp., representing Utah Chapter ICC, requests Disapproved.

Commenter’s Reason: The Utah Chapter of ICC urges disapproval of Item E80-02. In Utah we’ve adopted the 2000 IBC and are actively enforcing it. The state of Utah has invested a good deal in training inspectors to use the 2000 IBC. We appreciate the current format which groups design requirements and components appropriate for each portion of the means of egress system together. It’s user friendly and leads to less misapplication. IT’S NOT BROKEN. The proposed reorganization does nothing to improve this chapter and is much worse regarding the interrelationship of the various aspects essential to a means of egress.

Almost every building’s means of egress is unique and it takes a good deal of understanding of the basic concepts to do an adequate job of design or plan review. The existing organization of Chapter 10 in the 2000 IBC contributes to that understanding. Once the format is understood, it is very easy to use. Following is a diagram we have used to illustrate the logic of current format:
Here are just a few questions for the E80-02 proponents:

In E80-02 to understand the scope of each part of the MOE it is necessary to look at Section 1003.1 (listing 1003 through 1012), Section 1013.1 (listing 1013 through 1016), Section 1017.1 (listing 1017 through 1022), and Section 1023. How is that supposed to be easier?

Why has the charging language been deleted from the proposed 1009? Aren’t the provisions for stairways and handrails required?

Why did the proponent place aisles and egress balconies in 1013 and locate corridors, which are also exit access components, three sections away in 1016 on the other side of design requirements?

With the E80 format, how does one determine whether or not travel distance should be measured in a corridor?

Why has the charging language been deleted from the proposed 1023.1? Aren’t the provisions for exit discharge required?

The current format works. Disapprove this step backward.

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E81-02
Chapters 11 and 12

Proposed Change as Submitted:

**Propponent:** Brian Black, Eastern Paralyzed Veterans Association

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CHAPTER 2
SECTION 202
DEFINITIONS

**DWELLING UNIT.** A single unit providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking and sanitation.

**SLEEPING UNIT.** A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

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CHAPTER 11
SECTION 1102
DEFINITIONS

**1102.1 General**

**ACCESSIBLE UNIT.** A dwelling unit or sleeping unit that complies with this code and Chapters 1-9 of ICC A117.1.

**DWELLING UNIT OR SLEEPING UNIT, TYPE A.** A dwelling unit or sleeping unit designed and constructed...
for accessibility in accordance with ICC A117.1.

**DWELLING UNIT OR SLEEPING UNIT, TYPE B.** A dwelling unit or sleeping unit designed and constructed for accessibility in accordance with ICC A117.1, consistent with the design and construction requirements of the federal Fair Housing Act.

**DWELLING UNIT OR SLEEPING UNIT, MULTISTORY.** A dwelling unit or sleeping unit with habitable space located on more than one story.

**INTENDED TO BE OCCUPIED AS A RESIDENCE.** This refers to a dwelling unit or sleeping unit that can or will be used all or part of the time as the occupant's place of abode.

### SECTION 1103
**SCOPING REQUIREMENTS**

**1103.2.11 Residential Group R-1.** Buildings of Group R-1 containing not more than five sleeping units for rent or hire that are also occupied as the residence of the proprietor, are not required to be accessible.

**1103.2.12 Day care facilities.** Where a day care facility (Groups A-3, E, I-4 and R-3) is part of a dwelling unit, only the portion of the structure utilized for the day care facility is required to be accessible.

### SECTION 1104
**ACCESSIBLE ROUTE**

**1104.4 Multilevel buildings and facilities.** At least one accessible route shall connect each accessible level, including mezzanines, in multi-level buildings and facilities.

**Exceptions:**
1. An accessible route is not required to floors above and below accessible levels that have an aggregate area of not more than 3,000 square feet (278.7 m²). This exception shall not apply to:
   1.1 Multiple tenant facilities of Group M, occupancies containing five or more tenant spaces;
   1.2 Levels containing offices of health care providers (Group B or Group I); or
   1.3 Passenger transportation facilities and airports (Group A-3 or Group B).
2. In Groups A-1, R and S occupancies, levels that do not contain accessible elements or other spaces required by Sections 1107 or 1108 are not required to be served by an accessible route from an accessible level.
3. In Groups I and R occupancies, level that do not contain Accessible units or Type A units required by Sections 1107 or elements or spaces that serve Accessible units or Type A units, are not required to be served by an accessible route from an accessible level.

4. In Groups I and R occupancies, levels that do not contain Type B units required by Chapter 12, or elements or spaces that serve Type B units, are not required to be served by an accessible route from an accessible level.

**1104.5 Location.** Accessible routes shall coincide with or be located in the same area as a general circulation path. Where the circulation path is interior, the accessible route shall also be interior.

**Exception:** Accessible routes from parking garages contained within and serving Type B dwelling units are not required to be interior.

### SECTION 1105
**ACCESSIBLE ENTRANCES**

**1105.1 Required.** At least 50 percent but not less than one entrance to each building and structure, and each separate tenant space within the building or structure, shall comply with the accessible route provisions of this chapter.

**Exceptions:**
1. Entrances to spaces not required to be accessible as provided for in Sections 1107 or 1108.
2. Loading and service entrances that are not the only entrance to a building or to a tenant space.
3. **Entrances to Group I or R dwelling units or sleeping units that are not required to be Type B units by Chapter 12.**
4. **Entrances to Group I or R dwelling units or sleeping units that are not required to be Type B units by Chapter 12.**

### SECTION 1106
**PARKING AND PASSENGER LOADING FACILITIES**

**1106.2 Groups R-2 and R-3.** Two percent, but not less than one, of each type of parking space provided for occupancies in Groups R-2 and R-3, which are required to have Type A or Type B dwelling or sleeping units, shall be accessible. Where parking is provided within or beneath a building, accessible parking spaces shall also be provided within or beneath the building.
SECTION 1107
DWELLING UNITS AND SLEEPING UNITS

1107.1 General. In addition to the other requirements of this chapter, occupancies having dwelling units or sleeping units shall be provided with accessible features in accordance with Sections 1107.2 through 1107.7.5.

1107.2 Design. Dwelling units and sleeping units which are required to be accessible units shall comply with this code and the applicable portions of Chapters 1-9 of ICC A117.1. Type A and Type B units shall comply with the applicable portions of Chapter 10 of ICC A117.1. Units required to be Type A units are permitted to be designed and constructed as accessible units. Units required to be Type B units are permitted to be designed and constructed as accessible units or as Type A units.

1107.3 Accessible spaces. Rooms and spaces available to the general public or available for use by residents and serving accessible units, or Type A units or Type B units shall be accessible. Accessible spaces shall include toilet and bathing rooms, kitchen, living and dining areas and any exterior spaces, including patios, terraces and balconies.

Exception: Recreational facilities in accordance with Section 1109.14.

1107.4 Accessible route. At least one accessible route shall connect accessible building or facility entrances with the primary entrance of each accessible unit, and Type A unit and Type B unit within the building or facility and with those exterior and interior spaces and facilities that serve the units.

Exceptions:
1. If the slope of the finished ground level between accessible facilities and buildings exceeds one unit vertical in 12 units horizontal (1:12), or where physical barriers prevent the installation of an accessible route, a vehicular route with parking that complies with Section 1106 at each public or common use facility or building is permitted in place of the accessible route.

2. Exterior decks, patios, or balconies that are part of Type B units and have impervious surfaces, and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the unit.

1107.5 Group I. Occupancies in Group I shall be provided with accessible features in accordance with Sections 1107.5.1 and 1107.5.1.2.

1107.5.1 Accessible units. At least 4 percent, but not less than one, of the dwelling units and sleeping units shall be accessible units.

1107.5.1.1 Type B units. In structures with four or more dwelling or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with 1107.7.

1107.5.2 Group I-2 Nursing homes. In Nursing homes of Group I-2 shall be provided with accessible features in accordance with Sections 1107.5.2.1 and 1107.5.2.2.

1107.5.2.1 Accessible units. At least 50 percent, but not less than one, of the dwelling units and sleeping units shall be accessible units.

1107.5.2.2 Type B units. In structures with four or more dwelling or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with 1107.7.

1107.5.3 Group I-2 Hospitals. In general purpose hospitals, psychiatric facilities, detoxification facilities and residential care/assisted living facilities of Group I-2, shall be provided with accessible features in accordance with Section 1107.5.3.1 and 1107.5.3.2.

1107.5.3.1 Accessible units. At least 10 percent, but not less than one, of the dwelling units and sleeping units shall be accessible units.

1107.5.3.2 Type B units. In structures with four or more dwelling or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with 1107.7.

1107.5.4 Group I-2 Rehabilitation Facilities. In hospitals and rehabilitation facilities of Group I-2 which specialize in treating conditions that affect mobility, or units within either which specialize in treating conditions that affect mobility, 100 percent of the dwelling units and sleeping units shall be accessible units.

1107.5.5 Group I-3. In occupancies in Group I-3, at least 5 percent, but not less than one, of the dwelling units and sleeping units shall be accessible units.
1107.6 Group R. Occupancies in Group R shall be provided with accessible features in accordance with Sections 1107.6.1 through 1107.6.3.

1107.6.1 Group R-1. Group R-1 occupancies shall be provided with accessible features in accordance with Sections 1107.6.1.1 and 1107.6.1.2:

1107.6.1.1 Accessible units. In occupancies in Group R-1, accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.4. All facilities on a site shall be considered to determine the total number of accessible units. Accessible units shall be dispersed among the various classes of units. Roll-in showers provided in accessible units shall include a permanently mounted folding shower seat.

<table>
<thead>
<tr>
<th>TOTAL NUMBER OF UNITS PROVIDED</th>
<th>MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS ASSOCIATED WITH ROLL-IN SHOWERS</th>
<th>TOTAL NUMBER OF REQUIRED ACCESSIBLE UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 25</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>26 to 50</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>51 to 75</td>
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<td>4</td>
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<td>76 to 100</td>
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<td>5</td>
</tr>
<tr>
<td>101 to 150</td>
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<td>7</td>
</tr>
<tr>
<td>151 to 200</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>201 to 300</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>301 to 400</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>401 to 500</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>501 to 1,000</td>
<td>1% of total</td>
<td>3% of total</td>
</tr>
<tr>
<td>Over 1,001</td>
<td>10 plus 1 for each 100 over 1,000</td>
<td>30 plus 2 for each 100 over 1,000</td>
</tr>
</tbody>
</table>

1107.6.1.2 Type B units. In structures with four or more dwelling or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with 1107.7.

1107.6.2 Group R-2. Type A and Type B units shall be provided in occupancies in Group R-2 in accordance with Sections 1107.6.2.1 and 1107.6.2.2.

1107.6.2.1 Type A units. In occupancies in Group R-2 containing more than 20 dwelling units or sleeping units, at least 2 percent, but not less than one, of the units shall be a Type A unit. All units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units.

Exceptions:
1. The number of Type A units is permitted to be reduced in accordance with 1107.7.
2. Existing structures on a site shall not contribute to the total number of units on a site.

1107.6.2.2 Type B units. Where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.6.3 Group R-3. In occupancies in Group R-3 where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with 1107.7.

1107.6.4 Group R-4. In Group R-4 occupancies shall be provided with accessible features in accordance with Sections 1107.6.4.1 and 1107.6.4.2.

1107.6.4.1 Accessible units. At least one of the dwelling or sleeping units shall be an accessible unit.

1107.6.4.2 Type B units. In structures with four or more dwelling or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with 1107.7.

1107.7 General exceptions. Where specifically permitted by Sections 1107.5 or 1107.6, the required number of Type A and Type B units is permitted to be reduced in accordance with Sections 1107.7.1 through 1107.7.5.
1107.7.1 Buildings without elevator service. Where no elevator service is provided in a building, only the dwelling and sleeping units that are located on stories indicated in Sections 1107.7.1.1 and 1107.7.1.2 are required to be Type A and Type B units. The number of Type A units shall be determined in accordance with Section 1107.6.2.

1107.7.1.1 One story with Type B units required. At least one story containing dwelling units or sleeping units intended to be occupied as a residence shall be provided with an accessible entrance from the exterior of the building and all units intended to be occupied as a residence on that story shall be Type B units.

1107.7.1.2 Additional stories with Type B units. On all other stories that have a building entrance in proximity to arrival points intended to serve units on that story, as indicated in items 1 and 2, all dwelling units and sleeping units intended to be occupied as a residence served by that entrance on that story shall be Type B units:

1. Where the slopes of the undisturbed site measured between the planned entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance are 10% or less, and

2. Where the slopes of the planned finished grade measured between the entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance are 10% or less.

Where no such arrival points are within 50 feet (15 240 mm) of the entrance, the closest arrival point shall be used unless that arrival point serves the story required by Section 1107.7.1.1.

1107.7.2 Multistory units. A multistory dwelling or sleeping unit which is not provided with elevator service is not required to be a Type B unit. Where a multistory unit is provided with external elevator service to only one floor, the floor provided with elevator service shall be the primary entry to the unit, shall comply with the requirements for a Type B unit, and a toilet facility shall be provided on that floor.

1107.7.3 Elevator service to the lowest story with units. Where elevator service in the building provides an accessible route only to the lowest story containing dwelling or sleeping units intended to be occupied as a residence, only the units on that story which are intended to be occupied as a residence are required to be Type B units.

1107.7.4 Site impracticability. On a site with multiple non-elevator buildings, the number of units required by Section 1107.7.1 to be Type B units is permitted to be reduced to a percentage which is equal to the percentage of the entire site having grades, prior to development, which are less than 10 percent, provided that all of the following conditions are met:

1. Not less than 20 percent of the units required by Section 1107.7.1 on the site are Type B units; and

2. Units required by Section 1107.7.1, where the slope between the building entrance serving the units on that story and a pedestrian or vehicular arrival point is no greater than 8.33 percent, are Type B units; and

3. Units required by Section 1107.7.1, where an elevated walkway is planned between a building entrance serving the units on that story and a pedestrian or vehicular arrival point and the slope between them is 10 percent or less are Type B units; and

4. Units served by an elevator in accordance with 1107.7.3 are Type B units.

1107.7.5 Base flood elevation. The required number of Type A and Type B units shall not apply to a site where the lowest floor or the lowest structural building members of non-elevator buildings are required to be at or above the base flood elevation resulting in:

1. A difference in elevation between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm) exceeding 30 inches (762 mm), and

2. A slope exceeding 10 percent between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm).

Where no such arrival points are within 50 feet (15 240 mm) of the primary entrances, the closest arrival point shall be used.

SECTION 1109
OTHER FEATURES AND FACILITIES

1109.1 General. Accessible building features and facilities shall be provided in accordance with Sections 1109.2 through 1109.15.

Exception: Type A and Type B dwelling and sleeping units shall comply with ICC A117.1.

Revise as follows:
CHAPTER 12
TYPE B DWELLING AND SLEEPING UNITS

SECTION 1201
GENERAL

1201.1 Scope. The provisions of this chapter shall control the design and construction of facilities intended to be consistent with the requirements of the federal Fair Housing Act.

SECTION 1202
DEFINITIONS

1202.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the same meaning as shown herein.

DWELLING UNIT OR SLEEPING UNIT, TYPE B. A dwelling unit or sleeping unit designed and constructed for accessibility in accordance with ICC A117.1, consistent with the design and construction requirements of the federal Fair Housing Act.

DWELLING UNIT OR SLEEPING UNIT, MULTISTORY. A dwelling unit or sleeping unit with habitable space located on more than one story.

INTENDED TO BE OCCUPIED AS A RESIDENCE. This refers to a dwelling unit or sleeping unit that can or will be used all or part of the time as the occupant’s place of abode.

SECTION 1203
DWELLING AND SLEEPING UNITS

1203.1 General. In addition to the other requirements of this chapter, occupancies having dwelling units or sleeping units shall be provided with features in accordance with Sections 1203.2 through 1203.7.5.

1203.2 Design. Dwelling units and sleeping units which are required to be Type B units shall comply with this code and the applicable portions of Chapter 10 of ICC A117.1. Units required to be Type B units are permitted to be designed and constructed as Accessible units or as Type A units as specified in Chapter 11.

1203.3 Accessible spaces. Rooms and spaces available to the general public or available for use by residents and serving Type B units shall comply with Chapter 11.

Exception: Recreational facilities in accordance with Section 1109.14.

1203.4 Accessible route. At least one accessible route shall connect accessible building or facility entrances with the primary entrance of each Type B unit within the building or facility and with those exterior and interior spaces and facilities that serve the units.

Exceptions:
1. If the slope of the finished ground level between accessible facilities and buildings exceeds one unit vertical in 12 units horizontal (1:12), or where physical barriers prevent the installation of an accessible route, a vehicular route with parking that complies with Section 1106 at each public or common use facility or building is permitted in place of the accessible route.

2. Exterior decks, patios, or balconies that are part of Type B units and have impervious surfaces, and that are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the unit.

1203.5 Group I. Occupancies in Group I shall be provided with features in accordance with 1203.5.1 through 1203.5.3.

1203.5.1 Group I-1. In Group I-1 occupancies, structures with four or more dwelling or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

1203.5.2 Group I-2 Nursing homes. In Nursing homes of Group I-2, structures with four or more dwelling or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with 1203.7.

1203.5.3 Group I-2 Hospitals. In general purpose hospitals, psychiatric facilities, detoxification facilities and residential care/assisted living facilities of Group I-2, structures with four or more dwelling or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1203.7.

1203.6 Group R. Occupancies in Group R shall be provided with accessible features in accordance with Sections 1203.6.1 through 1203.6.4.

1203.6.1 Group R-1. In Group R-1 occupancies, where there are four or more dwelling or sleeping units intended to be occupied as a residence in a single
structure, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with 1203.7.

1203.6.2 Group R-2. In Group R-2 occupancies, where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with 1203.7.

1203.6.3 Group R-3. In occupancies in Group R-3 where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with 1203.7.

1203.6.4 Group R-4. In Group R-4 occupancies where there are four or more dwelling or sleeping units intended to be occupied as a residence in a single structure, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

**Exception:** The number of Type B units is permitted to be reduced in accordance with 1203.7.

1203.7 General exceptions. Where specifically permitted by Sections 1203.5 or 1203.6, the required number of Type B units is permitted to be reduced in accordance with Sections 1203.7.1 through 1203.7.5.

1203.7.1 Buildings without elevator service. Where no elevator service is provided in a building, only the dwelling and sleeping units that are located on stories indicated in Sections 1203.7.1.1 and 1203.7.1.2 are required to be Type B units.

1. Where the slopes of the undisturbed site measured between the planned entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance are 10% or less, and

2. Where the slopes of the planned finished grade measured between the entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance are 10% or less.

Where no such arrival points are within 50 feet (15 240 mm) of the entrance, the closest arrival point shall be used unless that arrival point serves the story required by Section 1203.7.1.1.

1203.7.2 Multistory units. A multistory dwelling or sleeping unit which is not provided with elevator service is not required to be a Type B unit. Where a multistory unit is provided with external elevator service to only one floor, the floor provided with elevator service shall be the primary entrance to the unit, shall comply with the requirements for a Type B unit, and a toilet facility shall be provided on that floor.

1203.7.3 Elevator service to the lowest story with units. Where elevator service in the building provides an accessible route only to the lowest story containing dwelling or sleeping units intended to be occupied as a residence, only the units on that story which are intended to be occupied as a residence are required to be Type B units.

1203.7.4 Site impracticality. On a site with multiple non-elevator buildings, the number of units required by Section 1203.7.1 to be Type B units is permitted to be reduced to a percentage which is equal to the percentage of the entire site having grades, prior to development, which are less than 10 percent, provided that all of the following conditions are met:

1. Not less than 20 percent of the units required by Section 1203.7.1 on the site are Type B units; and

2. Units required by Section 1203.7.1, where the slope between the building entrance serving the units on that story and a pedestrian or vehicular arrival point is no greater than 8.33 percent, are Type B units, and

3. Units required by Section 1203.7.1, where an elevated walkway is planned between a building entrance serving the units on that story and a pedestrian or vehicular arrival point and the slope between them is 10 percent or less are Type B units, and
4. Units served by an elevator in accordance with 1203.7.3 are Type B units.

1203.7.5 Base flood elevation. The required number of Type B units shall not apply to a site where the lowest floor or the lowest structural building members of non-elevator buildings are required to be at or above the base flood elevation resulting in:

1. A difference in elevation between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm) exceeding 30 inches (762 mm), and

2. A slope exceeding 10 percent between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm).

Where no such arrival points are within 50 feet (15 240 mm) of the primary entrances, the closest arrival point shall be used.

**Proponent’s Reason:** Despite its length, this proposal is solely an editorial change. It extracts all requirements for Type B dwelling and sleeping units from Chapter 11 Accessibility and relocates them to a new Chapter 12 Fair Housing. The surface reason for this change is simple: Type B dwelling units are not accessible and thus should not be regulated in the IBC Accessibility Chapter.

When the A117 Accredited Standard Committee approved its requirements for Type B dwelling units, it went to considerable lengths to clarify that Type B units are not accessible. The ICC/ANSI A117.1-1998 standard states:

1. **Purpose**

   The specifications in Chapters 3 through 9, and Sections 1002 and 1004 of this standard make sites, facilities, buildings and elements accessible to and usable by people with such physical disabilities as the inability to walk, difficulty walking, reliance on walking aids, blindness and visual impairment, deafness and hearing impairment, incoordination, reaching and manipulation disabilities, lack of stamina, difficulty interpreting and reacting to sensory information, and extremes of physical size. The intent of these sections of the standard is to allow a person with a physical disability to independently get to, enter, and use a site, building or element.

   **Section 1003 of this standard provides technical criteria for Type B dwelling units.** These criteria are intended to be consistent with the intent of only the technical requirements of the Federal Fair Housing Amendments Act Accessibility Guidelines. These Type B dwelling units are intended to supplement, not replace, accessible Type A dwelling units as specified in this standard. (emphasis added)

   Thus everything but the Type B dwelling unit requirements in Section 1003 deals with accessibility. Type B dwelling units are not only not accessible, they should not replace (be confused with) accessible dwelling units.

   Existing IBC text has already misapplied the term “accessible” to Type B applications. The Section 1106.2 parking requirements refer to R-2 and R-3 occupancies with “accessible” dwelling units, when the requirement is clearly meant to apply to projects with only Type B (inaccessible) units. This coincides with the federal fair housing requirements for accessible parking that similarly apply. Section 1107 of the code alludes to “accessible” Type B units in numerous locations, even though these units are clearly not accessible as specified by the consensus committee that created the Type B criteria.

   This proposal is not a simple “housecleaning” or nitpicking. It is critical if the ICC is to retain the integrity of the meaning of the term “accessibility” as defined in the standard it supports and develops as Secretariat to the A117 Committee. It makes no sense for one ICC document to casually refer to these units as accessible when another ICC document goes to great lengths to clarify that Type B units are not accessible.

   In 1998, the Eastern Paralyzed Veterans Association and others feared that the subtleties of the A117 “Purpose” language would be lost, and that Type B units would soon be considered accessible and usable by persons with disabilities. By the time the IBC 2000 was published, our worst fears came to pass. Type B dwelling units are becoming the norm, the established baseline for accessible dwelling units. They are portrayed as “adaptable” (they are not), while Type A provisions that were previously considered adaptable by the A117.1 standard committee and the model codes are now portrayed as hyper-accessible, “wheelchair-fitted”, and actually dangerous to persons who don’t use wheelchairs! One national industry representative went so far at to try to have ICC delete the Type A criteria from its “Code Requirements for Housing Accessibility” publication, leaving only the Type B inaccessible units and no technical requirements for accessible dwelling units in this new “accessibility” code!

   The IBC voting members must resolve the increasing ambiguity and resulting dilution of our code’s accessibility requirements by removing the IBC Type B requirements from the Accessibility chapter to a more appropriate Fair Housing chapter. The “users” of our code don’t understand the distinction between what is truly accessible and what is merely meant to reflect federal regulations, and the IBC undermines the intent of the A117 Committee by perpetuating the Type B—accessibility confusion. This code change will correct this problem.

**Analysis:** A point for committee discussion is if the text in proposed Chapter 12 should be located in Chapter 4 with other special requirements instead of an entire new chapter.

**Editorial note:** A 19 point amendment was proposed to be added to the published proposal. The question was split into two items for purposes of discussion. The published proposal is Item 1, and the amendment to the proposal is Item 2. Item 2 points that were approved are reported as 1 through 13. Six Item 2 points were not approved.

**Committee Action:**

**Item 1. Disapproved**

**Item 2. Approved as Modified**

**Modify proposal as follows:**

For the amendment, modify the current text as follows:

1. **Definition - Facility:** The entire building or any portion of a building, structure or area, including the site on which such building, structure or area is located, wherein specific services are provided or activities are performed. All or any portion of buildings, structures, site improvements, elements, and pedestrian or vehicular routes located on a site.

2. **1003.2.5.2 Free-standing objects.** A free-standing object mounted on a post or pylon shall not overhang that post or pylon more than 12 inches (305 mm) where the lowest point of the leading edge is more than 27 inches (686 mm) and less than 80 inches (2032 mm) above the walking surface. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2030 mm) minimum above the finish floor or ground.

**Exception:** This requirement shall not apply to sloping portions of handrails serving stairs and ramps.
3. **1003.2.10.2 Stairway Tactile exit signs:** A tactile sign stating EXIT and complying with ICC A117.1 shall be provided adjacent to each door to an egress stairway, an exit passageway and the exit discharge.

4. **1003.2.13.4 Platform lifts.** Platform (wheelchair) lifts shall not serve as part of an accessible means of egress, except where allowed as part of a required accessible route in Section 1109.7. Platform lifts shall be installed in accordance with ASME A18.1. Standby power shall be provided for platform lifts permitted to serve as part of a means of egress.

5. **1103.2.13 Detention and Correctional Facilities.** In detention and correctional facilities, common use areas that are used only by inmates or detainees and security personnel and that do not serve holding cells or housing cells required to be accessible, are not required to be accessible or to be served by an accessible route.

6. **1104.1 Site arrival points:** Accessible routes within the site shall be provided from public transportation stops, accessible parking and accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance served.

**Exception:** An accessible route shall not be required between site arrival points and the building or facility entrance if the only means of access between them is a vehicular way not providing for pedestrian access.

7. **1104.2 Within a site:** At least one accessible route shall connect accessible buildings, accessory facilities, accessible elements, and accessible spaces that are on the same site.

**Exception:** An accessible route is not required between accessible buildings, accessory facilities, accessible elements, and accessible spaces that have, as the only means of access between them, a vehicular way not providing for pedestrian access.

8. **1104.3 Connected spaces:** When a building, or portion of a building, is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances, connecting accessible pedestrian walkways and the public way. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.

**Exceptions:**
1. In assembly areas with fixed seating required to be accessible, an accessible route shall not be required to serve fixed seating where wheelchair spaces or designated aisle seats required to be on an accessible route are not provided.
2. Accessible routes shall not be required to mezzanines provided that the building or facility has no more than one story, or where multiple stories are not connected by an accessible route as permitted by Section 1104.4.
3. A single accessible route is permitted to pass through a kitchen or storage room in an accessible dwelling unit.

9. **1104.6 Security Barriers:** Security barriers including, but not limited to, security bollards and security check points shall not obstruct a required accessible route or accessible means of egress.

**Exception:** Where security barriers incorporate elements that cannot comply with these requirements, such as certain metal detectors, fluoroscopes, or other similar devices, the accessible route shall be provided adjacent to security screening devices. The accessible route shall permit persons with disabilities passing around security barriers to maintain visual contact with their personal items to the same extent provided others passing through the security barrier.

10. **1109.8.2 Shelving and display units:** Self-service shelves and display units in mercantile occupancies and shelving in stack areas of libraries shall be located on an accessible route. Such shelving and display units shall not be required to comply with reach-range provisions.

11. **1109.13 Controls, operating mechanisms and hardware.** Controls, operating mechanisms and hardware intended for operation by the occupant, including switches that control lighting and ventilation, and electrical convenience outlets, in accessible spaces, along accessible routes or as parts of accessible elements shall be accessible.

**Exceptions:**
1. Operable parts that are intended for use only by service or maintenance personnel shall not be required to be accessible.
2. Electrical or communication receptacles serving a dedicated use shall not be required to be accessible.
3. Where two or more outlets are provided in a kitchen above a length of counter top that is uninterrupted by a sink or appliance, one outlet shall not be required to be accessible.
4. Floor electrical receptacles shall not be required to be accessible.
5. HVAC diffusers shall not be required to be accessible.
6. Except for light switches, where redundant controls are provided for a single element, one control in each space shall not be required to be accessible.

12. **APPENDIX E:**

**E104.2 Accessible beds.** In rooms or spaces having four or more beds, the number of accessible beds in each room shall be provided in accordance with Table E104.2. If facilities for separate sexes are provided, accessible beds must be dispersed for both sexes. In rooms or spaces having more than 25 beds, five percent of the beds shall have a clear floor space complying with ICC A117.1.

<table>
<thead>
<tr>
<th>Table E104.2 ACCESSIBLE BEDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL NUMBER OF BEDS IN DWELLING UNITS OR SLEEPING UNITS</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>4 to 25</td>
</tr>
<tr>
<td>26 to 50</td>
</tr>
<tr>
<td>51 to 75</td>
</tr>
<tr>
<td>76 to 100</td>
</tr>
<tr>
<td>101 to 150</td>
</tr>
<tr>
<td>151 to 200</td>
</tr>
<tr>
<td>201 to 300</td>
</tr>
<tr>
<td>301 to 400</td>
</tr>
<tr>
<td>401 to 600</td>
</tr>
<tr>
<td>501 to 1,000</td>
</tr>
<tr>
<td>Over 1,000</td>
</tr>
</tbody>
</table>

**E105.2 Portable toilets and bathing rooms:** Where multiple single user portable toilet or bathing units are clustered at a single location, at least 5 percent, but not less than one toilet unit or bathing unit at each
shall comply with ICC A117.1. Signs containing the International Symbol of Accessibility and complying with ICC A117.1 shall identify accessible portable toilets and bathing units.

**E105.3 Laundry equipment:** Where provided in spaces required to be accessible, washing machines or and clothes dryers are provided in spaces required to be accessible, at least one of each type shall comply with ICC A117.1 E105.3.

**E105.3.1 Washing Machines:** Where three or fewer washing machines are provided, at least one shall comply with ICC A117.1. Where more than three washing machines are provided, at least two shall comply with ICC A117.1.

**E105.3.2 Clothes Dryers:** Where three or fewer clothes dryers are provided, at least one shall comply with ICC A117.1. Where more than three clothes dryers are provided, at least two shall comply with ICC A117.1.

**E106.1 General:** Where coin-operated public pay telephones, coinless public pay telephones, public closed-circuit telephones, courtesy phones, or other types of public telephones are provided, accessible public telephones shall be provided in accordance with Sections E106.2 through E106.5 for each type of public telephone provided. For purposes of this section, a bank of telephones shall be considered two or more adjacent telephones.

**TABLE E106.2 WHEELCHAIR ACCESSIBLE TELEPHONES**

<table>
<thead>
<tr>
<th>Number of Telephones Provided on a Floor, or Level, or Exterior Site</th>
<th>Minimum Required Number of Wheelchair Accessible Telephones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or more single units</td>
<td>1 per floor, or level, and exterior site</td>
</tr>
<tr>
<td>1 bank</td>
<td>1 per floor, or level, and exterior site</td>
</tr>
<tr>
<td>2 or more banks</td>
<td>1 per bank*</td>
</tr>
</tbody>
</table>

*At least one telephone per floor shall provide a forward approach complying with ICC A117.1 except for exterior installations where dial-tone first service is available.

**E106.3 Volume controls:** Each wheelchair accessible telephone required by Section E106.2 and 25 percent, but not less than one, of other All public telephones provided shall have volume control complying with ICC A117.1. Such telephones shall be identified by signs containing pictograms of a telephone handset with radiating sound waves complying with ICC A117.1.

**Exception:** Pictograms are not required where every public telephone has volume control.

**E106.4.2 Floor requirement:** Where four or more public pay telephones are provided on a floor of a privately-owned building, at least one public TTY shall be provided on that floor. Where at least one public pay telephone is provided on a floor of a publicly-owned building, at least one public TTY shall be provided on that floor.

**E106.4.3 Building requirement:** Where four or more public pay telephones are provided in a privately-owned building, at least one public TTY shall be provided in the building. Where at least one public pay telephone is provided in a publicly-owned building, at least one public TTY shall be provided in the building.

**E106.4.7 Transportation facilities:** Transportation facilities shall be provided with TTYs in accordance with Sections E109.2.5 and E10.2 in addition to the TTYs required by Sections E106.4.1 through E106.4.4.

**E106.4.8 Detention and Correction Facilities:** In detention and correctional facilities, where a public pay telephone is provided in a secured area used only by detainees or inmates and security personnel, at least one TTY shall be provided in at least one secured area.

**E106.4.9 Signs:** Public TTYs shall be identified by the International Symbol of TTY complying with ICC A117.1. Directional signs indicating the location of the nearest public TTY shall be provided at banks of public pay telephones not containing a public TTY. In addition, where signs provide direction to public pay telephones, they shall also provide direction to public TTYs. Such signs shall comply with ICC A117.1 and shall include the International Symbol of TTY.

**E106.5 Shelves for portable TTYs:** Where a bank of telephones in the interior of a building consists of three or more public pay telephones, at least one public pay telephone at the bank shall be provided with a shelf and an electrical outlet in accordance with ICC A117.1.

**Exceptions:**
1. In secured areas of detention and correctional facilities if shelves and outlets are prohibited for purposes of security or safety shelves for and outlets for TTYs are not required to be provided.
2. The shelf and electrical outlet shall not be required at a bank of telephones with a TTY.

**E107.2 Permanent Designations:** Where interior and exterior signs are provided as identifying permanent designations of permanent interior rooms and spaces at the door to the spaces they serve, the signs shall be tactile. Where interior signs are provided as permanent designations of permanent interior rooms and spaces, the signs shall be tactile. Where pictograms are provided as permanent designations of permanent interior rooms and spaces, the pictograms shall have tactile text descriptors. Signs required to provide tactile signage characters and pictograms shall comply with ICC A117.1 - Section 703.4, Visual Characters.

**Exceptions:**
1. Exterior signs that are not located at the door to the space they serve are not required to comply.
2. Building directories, menus, seat and row designations in assembly areas, occupant names, building addresses, and company names and logos are not required to comply.
3. Signs in parking facilities are not required to comply.
4. Temporary, 7 days or less, signs are not required to comply.

**E107.3 Directional and informational signs:** Signs which provide direction to, or information about, permanent interior spaces of the site and facilities shall contain visual characters complying with ICC A117.1 - Section 703.4, Visual Characters.

**Exception:** Building directories, personnel names, company or occupant names and logos, menus and temporary, 7 days or less, signs are not required to comply with ICC A117.1 - Section 703.4, Visual Characters.

**E108.1 General:** Bus stops and terminals shall comply with Sections E108.2 through E108.5.

**E108.2 Bus stop pads** **Bus boarding and alighting areas:** Where new bus stop pads are constructed at bus stops, bays or other areas where a lift or ramp is to be deployed, they shall have tactile surfacing. Such pads shall comply with Sections E108.2.1 through E108.2.4.

**E108.2.1 Surface:** Bus boarding and alighting areas shall have a firm, stable surface.

**E108.2.2 Dimensions:** Bus stop pads shall have a clear length of 96 inches (2440 mm) minimum, measured
Section 108.2.3 Connection: Bus stop pads, boarding and alighting areas shall be connected to streets, sidewalks or pedestrian paths by an accessible route complying with Section 104.

Section 108.2.4 Slope: Parallel to the roadway, the slope of the bus stop pads, boarding and alighting area parallel to the roadway shall, to the extent practicable, be the same as the roadway, to the maximum extent practicable. For water drainage, a maximum slope of 1:48 perpendicular to the roadway is allowed.

Section 108.3 Bus shelters: Where provided, new or replaced bus shelters shall provide a minimum clear floor or ground space complying with ICC A117.1, Section 305, Clear Floor or Ground Space entirely within the shelter. Such shelters shall be connected by an accessible route to the boarding area required by E108.2.

Section 108.4 Signs: New bus route identification signs shall have finish and contrast complying with ICC A117.1, Section 703.4.1, Finish and Contrast. In addition, to the maximum extent practicable, new bus route identification signs shall provide visual characters complying with ICC A117.1, Section 703.4, Visual Characters.

Exception: Bus schedules, timetables and maps that are posted at the bus stop or bus bay are not required to comply with this requirement.

Section E109
Fixed Transportation Facilities and Stations

E109.1 General: Fixed transportation facilities and stations shall comply with the applicable provisions of Sections E109.2 through E109.4.

E109.2 New construction: New stations in rapid rail, light rail, commuter rail, intercity bus, intercity rail, high speed rail and other fixed guideway systems shall comply with Sections E109.2.1 through E109.2.9.

E109.2.1 Station entrances: Where different entrances to a station serve different transportation fixed routes or groups of fixed routes, at least one entrance serving each group or route shall comply with Section 1104 and ICC A117.1. Accessible entrances shall, to the maximum extent practicable, coincide with those used by the majority of the general public. In below ground subway stations, at least one entrance to each station shall comply with Section 1104 and ICC A117.1.

E109.2.2.1 Tactile signs: Where signs are provided at entrances to stations identifying the station or the entrance, or both, at least one sign at each entrance shall be tactile and shall comply with ICC A117.1, Section 703.2, Characters that are both Tactile and Visual. A minimum of one tactile sign identifying the specific station shall be provided on each platform or boarding area. Such signs shall be placed in uniform locations at entrances and on platforms or boarding areas within the transit system to the maximum extent practicable. Tactile signs shall comply with ICC A117.1.

Exceptions: Where the station has no defined entrance but signs are provided, the tactile signs shall be placed in a central location.

E109.2.2.2 Identification signs: Stations covered by this section shall have identification signs containing visual characters complying with ICC A117.1, Section 703.4, Visual Characters. Signs shall be clearly visible and within the sightlines of a standing or sitting passenger from within the train on both sides when not obstructed by another train.

E109.2.2.3 Informational signs: Lists of stations, routes and destinations served by the station which are located on boarding areas, platforms, or mezzanines shall provide visual characters complying with ICC A117.1, Section 703.4, Visual Characters. A minimum of one tactile sign identifying the specific station and complying with ICC A117.1, Section 703.2, Characters that are both Tactile and Visual shall be provided on each platform or boarding area. Signs covered by this provision shall, to the maximum extent practicable, be placed in uniform locations within the transit system.

Exception: Where sign space is limited, Directions to the ticket office, information about hours of operation, and other information not essential to the use of the transit system shall have a character height of 3 inches (75 mm) minimum and shall comply with ICC A117.1, Section 703.4, Visual Characters. Specific exit street names, directional information, and other information not essential to the use of the transit system shall have a character height of 1.75 inches (38 mm) minimum and shall comply with ICC A117.1, Section 703.4, Visual Characters.

E109.2.3 Fare machines: Self-service fare vending, collection and adjustment machines shall comply with ICC A117.1, Section 707, Automatic Teller Machines (ATMs) and Fare Machines. Where self-service fare vending, collection or adjustment machines are provided for the use of the general public, at least one accessible machine of each type provided shall be provided at each accessible point of entry or exit.

E109.2.4 Rail-to-platform height: In stations covered by this section, rail-to-platform height shall be coordinated with the floor height of new vehicles so that the vertical difference, measured when the vehicle is at rest, is within plus or minus 0.625 inch (15.9 mm) under normal passenger load conditions. For rapid rail, light rail, commuter rail, high speed rail, and intercity rail systems in new stations, the horizontal gap, measured when the new vehicle is at rest, shall be 3 inches (76 mm) maximum. For slow-moving automated guideway “people mover” transit systems, the horizontal gap in new stations shall be 1 inch (25.4 mm) maximum.

Exceptions:
1. For existing vehicles operating in new light rail, commuter rail, high speed rail, and intercity rail stations, the maximum vertical difference with respect to the new platform shall be plus or minus 1.5 inches (38 mm).
2. In light rail, commuter rail and intercity rail systems where it is not operationally or structurally feasible to meet the horizontal gap or vertical difference requirements, mini-high platforms, car-borne or platform-mounted lifts, ramps or bridge plates, or similar manually deployed devices meeting the applicable requirements of 36 CFR Part 1192, or 40 CFR Part 36 shall suffice.

E109.2.4 Rail-to-platform height: Station platforms shall be positioned to coordinate with vehicles in accordance with the applicable provisions of 36 CFR Part 1192. Low-level platforms shall be 8 inches (200 mm) minimum above top of rail.

Exception: Where vehicles are boarded from sidewalks or street-level, low-level platforms shall be permitted to be less than 8 inches.

E109.2.5 TTYs: Where a public pay telephone is provided in a transit facility (as defined by the Department of Transportation) at least one public TTY complying with ICC A117.1, Section 704.4, TTY, shall be provided in the station. In addition, where four or more public pay telephones serve a particular entrance to a rail station transportation facility, at least one TTY telephone complying with ICC A117.1, Section 704.4, TTY, shall be provided to serve that entrance.

E109.2.6 Track crossings: Where it is necessary to cross tracks to reach boarding platforms, the route surface shall be level with the rail.
top at the outer edge and between the rails, except for a 2.5 inch (64 mm) maximum gap on the inner edge of each rail to permit passage of wheel flanges. Where gap reduction is not practicable, an above-grade or below-grade accessible route shall be provided. Where a circulation path serving boarding platforms crosses tracks, an accessible route complying with ICC A117.1 shall be provided. Exception: Openings for wheel flanges shall be permitted to be 2-2 inch (64 mm) maximum.

E109.2.7 Public address systems: Where public address systems are provided to convey audible information to the public in terminals, stations or other fixed facilities, a means of conveying the same or equivalent information shall be provided in a visual format to persons with hearing loss or who are deaf shall be provided.

E110.3 Terminal information systems: Where terminal information systems that broadcast convey audible information to the general public through a public address system provide a means to provide the same or equivalent information to persons with a hearing loss or who are deaf shall be provided in a visual format.

#13. Add new:

APPENDIX J:

J102.2 Existing facilities: key stations. In rapid rail, light rail, and commuter rail, intercity rail, high speed rail, and other fixed guideway systems, altered stations and intercity rail and key stations, as defined under criteria established by the Department of Transportation in Subpart C of 49 CFR Part 37, and existing intercity rail stations shall comply with Sections J102.2.1 through J102.2.3.

J102.2.2 Rail-to-platform height. Platform and vehicle floor coordination. In light rail and commuter rail key stations, the platform or a portion thereof and the vehicle floor shall be coordinated so that the vertical difference, measured when the vehicle is at rest, within plus or minus 1.5 inches (38 mm) under normal passenger load conditions; and the horizontal gap, measured when the vehicle is at rest, is 3 inches (76 mm) maximum for at least one door of each vehicle or car required to be accessible by 49 CFR Part 37. Station platforms shall be positioned to coordinate with vehicles in accordance with the applicable provisions of 36 CFR Part 1192. Low-level platforms shall be 8 inches (200 mm) minimum above top of rail.

Exceptions:

1. Existing vehicles retrofitted to meet the requirements of 49 CFR Part 37.02 (one car per train route) shall be coordinated with the platform such that, for at least one door, the vertical difference between the vehicle floor and the platform, measured when the vehicle is at rest with 60 percent normal passenger capacity, is within plus or minus 1.5 inches (38 mm) and the horizontal gap is 4 inches (100 mm) maximum.

2. Where it is not structurally or operationally feasible to meet the horizontal or vertical difference requirements, mini-high platforms, car-borne or platform mounted lifts, ramps or bridge plates, or similar manually deployed devices, meeting the applicable requirements of 36 CFR Part 1192 shall suffice.

Where vehicles are boarded from sidewalks or street-level, low-level platforms shall be permitted to be less than 8 inches.

J102.3 Direct connections. New direct connections to commercial, retail or residential other facilities shall, to the maximum extent feasible, have an accessible route complying with Section 3408.6 from the point of connection to boarding platforms and transportation system elements used by the public. Any elements provided to facilitate future direct connections shall be on an accessible route connecting boarding platforms and transportation system elements used by the public.

J102.4 Existing facilities: alterations. For the purpose of complying with Section 3408.6, an area of primary function shall be as defined by applicable provisions of 49 CFR Part 37.13(c) or 28 CFR Part 36.400.

Committee Reason: Item 1: The Committee cited several reasons for disapproval. While the Type B unit is not as accessible as a Type A unit, the lesser level of accessibility provided in a Type B units is not a reason to remove the Type B units from Chapter 11. The Type B units do include some accessibility features, such as controls within reach ranges. If the Type B unit needs to have increased levels of accessibility, that should be addressed in another matter. The Type B units are based on the Fair Housing ‘Accessibility’ Guideline, therefore, it is appropriate to include the Type B units in the Accessibility chapter of the IBC. Clarity in the code would be better served for the Type A and Type B units to be in the same Section of the code since they are related and required in the same Groups. In addition, the technical requirements for both Type A and Type B units are found together in the ICC A117.1.

Item 2: The amendments were proposed as a part of a coordination effort with the current draft of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) final rule. The amendment was ruled in order by the chair based on three reasons: 1) E81-02 is indicated as a change to the entire Chapter 11, therefore the proposed amendment does address the same subject; and 2) indication of the coordination effort with ADAAG in the supporting statements of several proposals offered in this cycle; and 3) precedence for coordination efforts was set with the committees previous acceptance of Code Change E70-00 for coordination with the Fair Housing Act.

Several items/amendments were proposed that were denied. The Committee provided the proponent with specific reasons for disapproval in hopes that they could be brought forward as part of the public comment process to support the IBC and ADAAG coordination efforts. Following are the comments from the Committee on the amendment points that were approved.

1. The scoping provisions clearly identify which pieces of a facility are affected. The broader definition for “Facility” is therefore appropriate.

2. The proposal provides the needed technical detail for free standing objects.

3. Tactile exit signage is appropriate for ‘Exits’ that are part of a means of egress that are not ‘Exit’ stairways. The committee felt that this proposal should be tied to where ‘Exit’ signage is required.

4. Standby power is not addressed in ASME A18.1. Requirements for standby power would utilize the ICC Electrical Code (through Chapter 27) for standby power options, one of which could be batteries. Emergency operation where these platform lifts are the only way out of a space is a critical element for safe evacuation.

5. This is an appropriate exception for jail facilities.

6. This is a correlation with Section 1104.2. The exception is required in Section 1104.1 so that you get the same exception when coming onto a site as you do between buildings on a site.

7. The additional words in the exception adds to clarity between the definition for Facility and this exception. The wording would match ADAAG proposed language.

8. The exception dealing with assembly seating is to clarify that accessible routes are not required to areas without accessible seating regardless if the area is on a different level, tier or floor. The exception for mezzanines of any size in a single story building is consistent with ADAAG’s exception for a 2nd level.

9. This proposal provides guidance for the designer when a security feature is required along an accessible route.

10. The concern is the usability or access to these types of elements regardless of which Group it might be in. Deletion of the specific locations is appropriate.

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11. The exceptions listed are similar to exception already located in ICC A117.1 for residential units (Section 1002.9 and 1003.9). Since the same problems exist in non-residential facilities, the exceptions are appropriate.

12. The proposed modifications to Appendix E is for coordination with ADAAG and intended for information only.

13. The requirements in Appendix J is for coordination with ADAAG for requirements in existing buildings and is intended for information only. These items will be brought forward into Appendix J as it is relocated into the Existing Building Code per Code Change EB117-02 as Appendix B.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Marsha K. Mazz, U.S. Access Board, representing U.S. Access Board, requests Approved as Modified by this comment.

Modify proposal as follows:

1104.3.2 Press Boxes: Press boxes in assembly areas shall be on an accessible route.

Exceptions:

1. An accessible route shall not be required to press boxes in bleachers that have points of entry at only one level provided that the aggregate area of all press boxes is 500 sq. feet (46 m²) maximum.

2. An accessible route shall not be required to free-standing press boxes that are elevated above grade 12 feet (3660 mm) minimum provided that the aggregate area of all press boxes is 500 sq. feet (46 m²) maximum.

Commenter's Reason: This proposal was part of a larger proposal that was attached to E81-02. This part of the proposal was disapproved because committee members were concerned that the original proposal used the term “assembly facilities” in the charging statement and this would cause the exceptions to be meaningless where several types of stadiums are in one facility e.g. football, baseball, and soccer as might be the case at a large university. The Access Board agrees with the committee’s concerns and has changed the scope to cover “assembly areas” so that each such assembly area is considered separately. The Access Board has also made corresponding changes in its draft guidelines. We would welcome the membership’s support in making this change in the IBC so that the ADA guidelines and IBC are more closely harmonized.

Public Comment 2:

Marsha K. Mazz, U.S. Access Board, representing U.S. Access Board and Brian Black, Eastern Paralyzed Veterans Association, requests Approved as Modified by this comment.

Modify the current text as follows:

1106.4 Van spaces. For every eight six or fraction of eight six accessible parking spaces, at least one shall be a van-accessible parking space.

Marsha Mazz’s Reason: This proposal was part of a larger proposal attached to E81-02. The committee disapproved this item because the supporting statement was not persuasive. The Access Board would like the Membership to support this proposal for the following reasons:

- This proposal has a minor economic impact affecting only facilities with more than 150 parking spaces total
- Unless angled parking spaces are provided, two accessible parking spaces are permitted to share a common access aisle reducing the impact by 5 linear feet minimum
- Few cars today are designed to permit transfer from a wheelchair into the driver’s seat with a door sufficiently wide to pass a folded wheelchair behind the seated driver into the rear passenger seat. Two door sedans manufactured in the 1960s and 1970’s were ideal for this but they have disappeared from even the second-hand market. Vans and minivans are the only reasonable option.
- We believe the State of Maryland adopted this requirement in 1999.
- This action will harmonize IBC with the new ADA and ABA Accessibility Guidelines (ADAAG)

Brian Black’s Reason: This was one piece of the “harmonization modifications” to E81-02 that was disapproved by the Code Committee for lack of substantiation. As a committee member, I voted for disapproval for just this reason. However, there are valid reasons for adopting this change.

Van accessible parking spaces provide added space in the access aisle to permit a wheelchair lift to exit out a side, sliding door of a van. The 60-inch width of a regular accessible parking space is insufficient for this equipment.

Increasing the number of van-accessible spaces is necessary for two reasons. First, use of accessible parking spaces is regulated by state Vehicle and Traffic Laws, and few if any states restrict the use of van spaces to persons who drive vans. Experience has shown that these spaces are typically taken by persons driving automobiles, leaving no parking options for the van driver who needs the extra space in the access aisle. Increasing the total number of van spaces will increase the chance that there will be an open space for the driver who needs it.

Second, the demographics of van use have changed dramatically in the past ten years. In the past, persons who use wheelchairs often opted for a 2-door coupe that could facilitate a transfer through the passenger door to a bench seat. The driver would then slide over, pull the passenger seat back forward, and pull his collapsed wheelchair behind the passenger seat. The problem is that the American automakers have stopped making the full-size 2-door coupes for which the 60-inch access aisle was designed. At the same time, changes in lift technology made the conversion of smaller minivans possible; the result has been a significant increase in van purchases by persons who use wheelchairs, justifying an increase in the percentage of van accessible spaces.

Public Comment 3:

Marsha K. Mazz, U.S. Access Board, representing U.S. Access Board, requests Approved as Modified by this comment.

Modify the current text as follows:
1109.1 Signs: Required accessible elements shall be identified by signs complying with ICC/ANSI A117.1 and containing the International Symbol of Accessibility at the following locations:

1. Accessible parking spaces required by Section 1106.1 except where the total number of parking spaces provided is four or less.
2.-8. (No change to current text)

Commenter’s Reason: This proposal was part of a larger proposal attached to E81-02 at the Pittsburgh hearings. The committee disapproved this item. However the Access Board is requesting that the Membership reconsider it because the current federal requirements contain no such exception. The change from 5 to 4 will harmonize the IBC with the Board’s draft revisions to the ADAAG. In its published Notice to revise ADAAG the Board proposed establishing 5 as the maximum number for its exception. However, the Board received a significant number of public comments from people with disabilities protesting the exception and received almost no support for the exception. In light of this, the Board believes it cannot justify an exception greater than 4.

E82-02
1102

Proposed Change as Submitted:

Proponent: Irvin J. Poke, AIA, State of Michigan; representing Bureau of Construction Codes, DCIS

Revise as follows:

1102.1 (Supp) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the following meanings:

INTENDED TO BE OCCUPIED AS A RESIDENCE. This refers to “Intended to be occupied as a residence” means that a dwelling unit or sleeping unit that can or will be used all or part of the time as the occupant’s place of abode consistent with the design and construction requirements of the federal Fair Housing Act, 42 U.S.C. § 3601 et seq.

Proponent’s Reason: This is intended to correct the unintended consequence of requiring all units in all hotels to comply with Section 1107.6.1.2 for Type “B” sleeping units. The Type “B” units are for compliance with the federal fair housing act, which does not regulate the non-residential hotels for the travel industry. The Means of Egress Committee objected to the words “design and construction” in the proposed definition. These words have been removed to address their concern. The net affect of the revised proposal is the reference to the federal statute for determination of applicability.

Public Comment 2:

Sarah A. Rice, Schirmer Engineering Corp. and John Berry of Cole & Russell, representing American Hotel & Lodging Association, requests Approved as Modified by this comment.

Modify proposal as follows:

1102.1 (Supp) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the following meanings:

INTENDED TO BE OCCUPIED AS A RESIDENCE. “Intended to be occupied as a residence” means that a dwelling unit or sleeping unit that is intended to be occupied for 30 or more consecutive days, and can or will be used all or part of the time as the occupant’s place of abode consistent with the design and construction requirements of the federal Fair Housing Act, 42 U.S.C. § 3601 et seq.

Commenter’s Reason: Section 1107.6.1.2 (Supp) currently requires, without exception, that in all Group R-1 occupancies “every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.” Where a Type B Unit is defined in Section 1102.1 (Supp) as a unit “designed and constructed for accessibility in accordance with the design and construction requirements of the federal Fair Housing Act.” And the term “intended to be occupied as a residence” is defined in Section 1102.1 (Supp) as “a dwelling unit or sleeping unit that can or will be used all or part of the time as the occupant’s place of abode.”
To understand the impact that a designation of a Type B Unit to a hotel guestroom, or “sleeping unit” means to the hotel industry, one must understand the requirements that are included within the FHA Guidelines for a adaptable unit (identified as a Type B Unit in the IBC and ICC/ANSI A117.1).

There are seven specific requirements in the FHA Guidelines for both Type “A” & “B” Units (accessible and adaptable respectively). They are:

1. Accessible Building Entrance on an Accessible Route: (Required by ADAAG)
2. Accessible and Useable Public and Common Use Areas: (Required by ADAAG)
3. Useable Doors: (Required by ADAAG & IBC)
4. Accessible Route into and through the Dwelling Unit: (Required for Adaptable/Type B Units.) This essentially requires an accessible path of at least 36” wide be provided throughout the entire unit around all furniture, etc. Any changes in elevation must also comply w/ the ICC/ANSI A117.1 standard regarding threshold heights, etc.
5. Light Switches, Electrical Outlets, Thermostats and other Environmental Controls are required to be in accessible locations: (Required for Adaptable/Type B Units.) This essentially requires all control devices throughout the dwelling unit to be located between 15” and 48” above the finish floor.
6. Reinforced Walls for Grab Bars: (Required for Adaptable/Type B Units.) This requirement is for wall blocking for grab bars be provided in the appropriate position for potential future installation for grab bars for toilets, bathtubs, bathrooms and showers.
7. Useable Kitchens and Bathrooms: (Required for Adaptable/Type B Units.) This requirement essentially requires a specific 30” X 48” clear floor space in front of or adjacent to all major appliances within the kitchen. It is important to note that neither the FHA Guidelines nor ICC/ANSI A117.1 require a 34” max. height sink/counter for a Type “B” Dwelling Unit.

A literal interpretation of Section 1107.6.1.2 (Supp) results in ALL sleeping units within a Group R-1 occupancy, regardless of content, being required to comply with requirements 4 through 7 for a Type B Unit (adaptable) in the FHA Guidelines.

Many interested parties have worked diligently to “harmonize” the IBC with both the FHA Guidelines and the ADAAG. But the issue of “scoping” as it relates to sleeping units in Group R-1 occupancies cannot be said to be an issue that can be “harmonized” at this time in the IBC as the entities that oversee these documents themselves HAVE NOT been harmonized. To include a requirement in the IBC for ALL sleeping units in Group R-1 occupancies would at this time be highly inappropriate and potentially create a conflict with the FHA Guidelines and ADAAG in the future.

At this time, the agencies charged with accessibility issues, HUD through the FHA Guidelines and DOJ through ADAAG, do not agree on the extent of the application of the requirement for sleeping units in Group R-1 occupancies to be Type B units. Conversations with individuals at HUD have stated that the FHA Guidelines are ABSOLUTELY applicable to all sleeping rooms in all types of hotels. However, conversations with individuals at DOJ indicated the opposite, that the FHA Guidelines were NEVER intended to apply to hotels that are not of the “extended stay” type. The question many individuals are having is - does the DOJ even have the authority to determine the intent of the FHA Guidelines?

An interesting part of the interpretation from HUD is that it contradicts the commentary to the current FHA Guidelines that suggests that it was HUD’s intent to include only the “extended stay” lodging properties. However, the actual wording in the code does not contain language that accurately differentiates between “transient” and “extended stay” sleeping units.

We cannot emphasize strongly enough that the implications of requiring all sleeping units to have to be Type “B” Unit extends far beyond simply meeting those items discussed in Items Nos. 4 through 7, discussed above. In addition to the architectural impact, conversations with the DOJ have indicated that it is important that the rights and responsibilities of a disabled individual and the manager/owner of a facility that operates a Type B Unit are very significant and can be problematic for a typical Group R-1 occupancy, i.e., the “civil” issues. If the entire requirements of the Fair Housing Act were to be applied to a hotel property, the occupant (or guest as they are traditionally referred to) has the “right” to make any modifications needed, to either the sleeping unit or common spaces to accommodate their specific disability.

The expense and effort for accomplishing these "modifications" is that of the occupant. Yes, the occupant, not the owner nor the manager. The owner or manager of the hotel would have no right to refuse to allow the occupant to accomplish the "modifications". The owner, or manager, only has the right to demand a deposit from the occupant equal to the cost of returning the unit to it’s original condition, except that a deposit could not be required if the modification did not make the space unusable by an occupant without a disability.

For example: Take the widening of a door vs. the lowering of a kitchen counter. The widening of a door is not considered to make the space unusable by an occupant without a disability. However, the lowering of a kitchen counter could make a space unusable by another occupant. It is important to note the extent of the modifications are not limited to the seven requirements previously discussed above, but rather appear to be unlimited in a Type B Unit (adaptable).

The potential effect of allowing guests to modify a sleeping unit to accommodate their individual disability without any level of regulation or supervision by the property owner or manager would have a tremendous impact on that property financially, aesthetically and life safety of the guest.

To address the issue of application, this proposal seeks to add text that clearly differentiates between those sleeping rooms that are used by "transient" guests and those that are "extended stay" guests. A time frame of 30 days is being proposed for inclusion in the definition of "intended to be occupied as a residence." Having a distinct period of time associated with the requirement for sleeping units to be Type B units allows for a uniform and reasonable application of the requirement.

Most of the Model Codes have associated the term “transient” with a period of less than 30 days for a long time. It has been included it the BOCA National Building Code since 1994, the SBCCI Standard Building Code since 1988, the NFPA Life Safety Code since 1991, and the 2000 IBC.

The association of the term “transient” with a period of 30 days was only recently deleted from the IBC through Code Change G34-00. The Committee Reason for acceptance of this code change was “for coordination with the Fair Housing Accessibility Guidelines...The proposed text is necessary for facilities that may be utilized for both transient and non-transient accommodations, such as an extended stay hotel, boarding house or dormitory.”

Without a provision that clearly differentiates "transient" from "extended stay" facilities, ALL sleeping units in Group R-1 occupancies will have to be designed and constructed as Type B sleeping units. An interpretation that is not fully endorsed by the entire “accessibility” community and which HUD was not even advocating 2 years ago.

Until the powers-that-be can decide who has jurisdiction over the interpretation and application of the FHA, it is inappropriate for the IBC to have a provision that is not supported fully by the accessibility community. When both the DOJ and HUD say that they have authority of the Fair Housing Act, and each of these entities are giving different interpretations on this issue, the IBC should not force the issue at this time, because what if the language in the IBC turns out to be wrong?
This is an issue of on-going debate and until this issue is solidly resolved it is inappropriate for the IBC to make a definitive statement on the application that could be radically different than the true intent. Being less restrictive cannot hurt as federal regulations will take precedence, but should the IBC contain language that is more restrictive than what is in the FHA Guidelines the IBC could find itself with a significant problem. If HUD or DOJ come to a consistent application/interpretation on this issue, it will by law take precedence over what the IBC says.

Therefore we ask that the membership overturn the action of the Code Development Committee and Approve Code Change E82-02 as modified.

See also Public Comment to Code Change E83-02.

Public Comment 3:

Cheryl Kent, U.S. Department of Housing and Urban Development, representing U.S. Department of Housing and Urban Development, requests Approved as Modified by this comment.

Modify proposal as follows:

1102.1 (Supp) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the following meanings.

INTENDED TO BE OCCUPIED AS A RESIDENCE. This refers to a dwelling unit or sleeping unit that can or will be used all or part of the time as the occupant’s place of abode.

Add new text as follows:

The following proposed new text is the Commentary Appendix from the ICC document, Code Requirements for Housing Accessibility 2000 (CRHA).

Appendix K

FAIR HOUSING ACT COMMENTARY

This appendix contains commentary regarding the differences between the Fair Housing Act and the CRHA and IBC on several issues in order to assist the user of this document in understanding the intent of the accessibility requirements of the Fair Housing Act in the context of the requirements in this document.

Section 1102

DEFINITIONS

Section 1102.1. "Intended to be Occupied as a Residence" is defined as "a dwelling unit or sleeping unit that can or will be used all or part of the time as the occupant’s place of abode." This language is added to clarify that, consistent with the Fair Housing Act, all dwelling units and sleeping units that can or will be used as a place of abode — even for a short time — must meet the requirements of Chapter 11, as modified by Appendix K. There is a presumption in the IBC that if a building is non-temporary, i.e., an occupant can stay for more than 30 days, it is covered by Chapter 11. In addition, under the Fair Housing Act, occupancies of fewer than 30 days may be required to meet the Act’s design and construction requirements for accessible multifamily housing. See 24 C.F.R. § 100.201; 56 Fed. Reg. at 9500; 54 Fed. Reg. at 3238 & 3244.

Accordingly, this commentary provides guidance for determining when short-term occupancies that might not typically be viewed as housing are covered by Chapter 11. Such short-term occupancies may include residential hotels and motels, corporate housing, and seasonal vacation units. They also include some occupancies in Use Group 1, such as nursing homes, assisted living facilities, hospices, and dormitories. Moreover, occupancies in Use Group R in which a person may stay for fewer than 30 days, such as timeshares, boarding houses, homeless shelters, and migrant farm worker housing, may be included.

The key factors in determining whether any of these occupancies are subject to Chapter 11’s requirements are whether the occupants would possess the right to return to the property and whether they would have anywhere else to which to return. If it is intended that an occupant will have a right to return to the property and will not have anywhere else to return, the unit is “intended to be occupied as a residence” and must meet Chapter 11’s requirements regardless of the length of stay. Thus, for example, homeless shelters where occupants have a right to return nightly are covered by the Act and Chapter 11 even if occupants stay only a few nights. In addition, nursing homes to which a resident moves after vacating his or her primary residence are subject to the Act/Chapter 11. (It is important to note that there may be instances in which a building is covered by both the Fair Housing Act/Chapter 11 and the Americans with Disabilities Act. See commentary on section 302.4.)

If the occupants have a right to return to the property but also have another place to which to return, the unit may still be subject to Chapter 11. Additional factors must be considered to determine whether the property is a short-term dwelling covered by the Act or a transient property that is not covered by the Act. These factors must be considered by owners, builders, developers, architects and other designers to determine whether or not a building must be designed and constructed in accordance with the Act and Chapter 11. The following factors must be considered depending on the type of occupancy.

Hotels, Motels, Corporate Housing and Seasonal Vacation Units

The following factors should be considered in determining whether hotels, motels, corporate housing, and seasonal vacation units where occupants can stay more than 30 days are subject to Chapter 11: 1) what amenities will be included inside the units, including kitchen facilities; 2) whether the property is to be marketed to the public as short-term housing; 3) whether the terms and length of occupancy will be established through a lease or other written agreement; and 4) how payment will be calculated, e.g., on a daily, weekly, monthly or yearly basis. If the amenities and operation of the units are closer to those of apartments than of hotels, they are subject to Chapter 11. For example, if a hotel is marketed as short-term housing, payment is made monthly, and the units contain kitchens, the hotel would be subject to the Act and Chapter 11.

Timeshares

Timeshare properties require a different analysis. Timeshare owners have an interest in the property, yet they typically stay less than 30 days. For a timeshare property to be subject to the Act’s requirements, the owners must have an ownership interest in the property itself, rather than in a vacation without ties to a particular property. The following additional factors must be considered to determine whether timeshare units must meet Chapter 11’s requirements: 1) whether traditional rights of ownership are to be unrestricted (e.g., whether the timeshare owner has the right to occupy, alter or exercise control over a particular unit over a period of time); 2) the nature of the ownership interest conveyed, e.g., fee simple; and 3) the extent to which the operations resemble those of a hotel, motel or inn (e.g., reservations, central registration, meals, laundry service). If an owners’ rights regarding the unit are subject to few restrictions and the operation of the units is closer to that of condominiums/ apartaments than of hotels, they are subject to Chapter 11.

Other Properties

With respect to most other occupancies, the following factors are also relevant to determine whether the units are subject to chapter 4: 1) whether the property is to be marketed as short-term housing; 2) whether the terms and length of occupancy will be established through a written agreement; 3) how payment will be calculated, e.g., on a daily.
weekly, monthly or yearly basis; and 4) what types of amenities and services are offered with the occupancy. For example, an assisted living facility which provides sleeping amenities and medical services to its occupants and bills them on a monthly basis would be subject to the Act's design and construction requirements. In addition, housing for migrant farm workers that is provided in conjunction with the workers' employment (whether or not rent is paid) and contains amenities for cooking and sleeping would be subject to the Act's requirements.

Section 1102.1 "Sleeping unit." The Fair Housing Amendments Act regulations define the term "dwelling unit" more expansively than does the IBC 2000. Section 100.201 of the Regulations defines the term "dwelling unit" as: "A structure, or part of a structure, that is occupied or intended to be occupied as the residence or home of one or more persons." Examples of dwelling units include: a single family home; an apartment unit within an apartment building; and in other types of dwellings in which sleeping accommodations are provided but toileting or cooking facilities are shared by occupants of more than one room or portion of the dwelling, rooms in which people sleep. Exceptions of the latter include dormitory rooms and sleeping accommodations in shelters intended for occupancy as a residence for homeless persons. The purpose of the definition of "sleeping unit" is to reflect this more expansive definition and to include sleeping units intended to be occupied as a residence within the appropriate accessibility provisions of Chapter 11. It should be noted that the term "sleeping unit" does not apply to bedrooms in single family detached dwellings occupied by a single household of related or unrelated individuals. As the definition states, such rooms and spaces that are also part of a dwelling unit are not sleeping units.

Section 302.4. Spaces used for different purposes. This section has been added in part because a dwelling unit or sleeping unit may be intended to be occupied at some times as a residence and at other times for a different purpose or at all times for one purpose. For example, a unit in a "residential" hotel or a boarding house may have all of the characteristics of either a dwelling unit, or a sleeping unit, and be designed, constructed, and marketed to accommodate persons who will use the unit as their residence for a period of time. Those units also may be anticipated to be occupied at other times by persons on a temporary basis and not as a residence. Similarly, a sleeping unit in a nursing home may be intended to serve both as the residence of the person occupying the room and as the place in which the resident receives medical care or supervision.

It is expected under the 2003 IBC that buildings with units that are intended to serve more than one purpose will comply with all applicable accessibility standards, including the requirements for Type B dwelling or sleeping units if they are intended to be occupied as a residence. In the particular examples, the public and common use areas of the buildings would be expected to meet all of the applicable accessibility requirements of the Fair Housing Act and the Americans with Disabilities Act that are reflected in the requirements for R-1 and I-2 uses contained in the 2003 IBC. The building also would have to comply with the requirements for R-1 and I-2 uses contained in the 2003 IBC (e.g., fire and safety requirements). The number of units specified in Section 1107.6.1.1 or Section 1107.5.2.1 would have to be accessible units, and all other units intended to be used some of the time as a residence, would have to be Type B units, with the exceptions contained in Section 1107.7.

Section 1103 SCOPING REQUIREMENTS

Section 1103.2.13 Residential Group R-1. During the review of the related provisions of the IBC 2000, HUD staff noted a possible concern with an exception for Residential Group R-1, that was not discussed or cited as a variance in the Department's final report. Section 1103.2.13 excepts from the accessibility provisions of Chapter 11, buildings of Group R-1 containing not more than five rooms for rent or hire which are also occupied as the residence of the proprietor. Because the term "rooms" does not necessarily include dwelling units or sleeping units that are intended to be occupied as a residence, it is unlikely that the exception would apply to buildings and dwelling units covered under the Fair Housing Act. However, a builder, architect, or permitting official should be aware that the Fair Housing Act exempts from coverage of the accessibility requirements only those buildings containing fewer than four dwelling units or sleeping units. With experience in the application of the new definitions of "sleeping unit" and "intended to be occupied as a residence" contained in the revisions to Section 1103.2.13 may be addressed in a future code change cycle.

Section 1106 PARKING AND PASSENGER LOADING FACILITIES

Section 1106.1 Required. The Fair Housing Accessibility Guidelines require that 2% of parking provided to residents be accessible, and also requires that this parking be distributed among all types of parking available, including parking garages that are made available to residents by assignment or rental. The Supplemental Notice to the Guidelines, Questions and Answers About the Guidelines, provided guidance on making such parking garages and accessible, requiring them to be 14'-2" wide and have a 10' vehicle door. There are other ways, of course, to make parking garages accessible. For consistency with the Fair Housing Act, the IBC modifies the provisions for parking to apply the scoping requirements to each type of parking provided. Where parking is provided on a residential site, and includes parking garages that are available for assignment or rental to residents, such parking garages are also required to be accessible and must meet the requirements for an accessible parking space, e.g., the width requirements of the parking space and the access aisle, and any other applicable requirements. The vehicle door to the garage must be aligned with the parking space, and not the access aisle. There must also be an accessible route from the access aisle within the garage and connecting to the accessible route to the entrances of the covered dwelling units.

Section 1106.2 Groups R-2 and R-3. The 2% scoping requirement for accessible parking spaces applies only to R2 and R3 occupancies. Where other occupancies are provided, e.g., public and common use facilities and parking for visitors, parking spaces are subject to the more stringent requirements of 1106.1, which requires 4% accessible parking spaces in lots having up to 100 spaces, and gradually tapers down to a 2% requirement for larger lots.

Section 1107 DWELLING UNITS AND SLEEPING UNITS

Section 1107.1.2 Additional stories with Type B units. This section of the code is intended to provide consistency with the requirements of the federal Fair Housing Act. The regulations issued by the U.S. Department of Housing and Urban Development implementing the Fair Housing Act recognize in its definition of "ground floor," that a building may have one or more ground floors. The regulations do not require there to be more than one ground floor, but in building designs that result in a design plan where you may access more than one floor from the exterior grade level, then both floors are required to be accessible. The CRHA uses the term "story" rather than "floor." Section 1107.7.1.2 is intended to provide a specific means for architects, designers and builders to use to determine whether additional stories, other than the required accessible story established under Section 1107.7.1, are close enough to the grade such that it is practical to provide accessibility.

Items 1 and 2 of 1107.7.1.2 consider the slope between the entrance and all arrival points serving that story that are within 50 feet of the entrance, or the closest arrival point if none within 50 feet, provided that the closest arrival point is not an arrival point serving the story required by Section 1107.7.1.1; and Items 1 and 2 require accessibility if the slope of any of these measurement is 10% or less. This test is performed on both the undisturbed site and the planned finished grade. Pedestrian and vehicular arrival points include public or resident parking areas; public transportation stops; passenger loading zones; and public streets or sidewalks. To determine practicality, the slope is measured at ground level from the point of the planned entrance on a straight line to each vehicular or pedestrian arrival point that is within 50
feet of the planned entrance, or to the closest arrival point, provided that the closest arrival point is not one serving the story required by Section 1107.7.1.1, if none are within 50 feet. In the case of sidewalks, the closest point to the entrance will be where a public sidewalk entering the site intersects with the sidewalk to the entrance. In the case of resident parking areas, the closest point to the planned entrance will be measured from the entry point to the parking area that is located closest to the planned entrance.  

When measuring the slope of the finished grade between the entrance and all pedestrian and vehicular arrival points, the slope is measured from the entrance to the top of the pavement of all vehicular and pedestrian arrival points within 50 feet of the planned entrance, or if there is none, to the pedestrian or vehicular arrival point that is closest to the planned entrance, as explained above. With respect to the planned entrance, the measurement is taken, on a horizontal plane, from the center of the doorway to each arrival point, whether the doorway is an entrance door to the building or an entrance door to a dwelling unit. In the case of a building with a covered breezeway that does not have an enclosure wall and doorway, the building entrance is considered to be the point at which the building area, as defined in the IBC, is entered at the center of the breezeway width.  

Section 1107.7.2 Multistory units. The preamble to HUD's Fair Housing Act regulations states that "townhouses consisting of more than one story are covered only if they have elevators and only if there are four or more such townhouses." (54 Fed. Reg. 3244, January 23, 1989. See also, 54 Fed. Reg. 3251.) The Fair Housing Accessibility Guidelines (56 Fed. Reg. 9762-9765, March 6, 1991), further interpret the application of the design and construction requirements of the Fair Housing Act as they apply to multistory units. The preamble to the Guidelines, Page 9481, notes that a multistory townhouse "is not a covered multifamily dwelling if the building does not have an elevator because the entire dwelling unit is not on the ground floor." The preamble to the proposed Guidelines specifically stated, though, that "...if the unit had an internal elevator, it would be subject to the Fair Housing Act requirements." See 55 Fed. Reg. 24377, June 15, 1990.  

Therefore, a multistory unit in a non-elevator building is not subject to Chapter 11 unless it has an internal elevator. Section 1107.7.2 would thus apply to those multistory units with an internal elevator. In addition, all public and common use areas serving that particular dwelling must comply with the applicable provisions of the code.  

The second sentence of Section 1107.7.2 addresses building configurations where the building has one or more public use elevators that are external to the unit, and there are multistory units in the building where only one floor of the multistory unit is served by the public elevator. In such cases, the floor of the unit served by the public elevator must be the primary entry to the unit and is subject to Chapter 11.  

SECTION 1109  
SIGNAGE  

Section 1109.1 Signs. During review of the 2000 IBC and related provisions, HUD staff noted a possible concern with respect to the Section 1109.1. Section 1109.1 requires that accessible elements shall be identified by the International Symbol of Accessibility, and with respect to accessible parking spaces, there is an exception where the total number of parking spaces provided on the site is 5 or less. Thus, the one accessible parking space required in such situations where there are 5 or less parking spaces on the entire site is not required to be identified by a sign. However, it should be noted that the Fair Housing Accessibility Guidelines do not provide an exception with respect to signage for accessible parking spaces, for residential sites that have only 5 parking spaces or less. HUD believes that in most situations, residential sites will have more than 5 parking spaces, and that the situation where the exception applies will not be a frequent occurrence. Thus, HUD does not believe this exception is tantamount to a variance; therefore a variance, and recommended language to address it, was not made in HUD's Final Report. With experience in the application of this provision, Section 1109.1 may be addressed in a future code change cycle.  

Commenter's Reason: The definition as it currently appears in the 2001 Supplement to the International Codes reflects language carefully developed as a result of technical guidance provided by the U. S. Dept. of HUD to ICC representatives, and representatives of the building industry and disability advocacy groups, at their request, to address deficiencies in the IBC identified in HUD's Final Report of its review of the Model Building Codes, (Federal Register, March 23, 2001), therefore it is important to retain the definition as is, and add the Appendix to the CRHA, to assure that the safe harbor recognition provided by HUD for the International Building Code is not jeopardized.  

Analysis to Public Comment #3: While the proposed language is currently in the Code Requirements for Housing Accessibility 2000 (CRHA), it is indicated as commentary. Per Section 101.2.1, the appendices in the IBC shall not apply unless specifically adopted. This proposed Appendix is commentary, and is not written or constructed so that it could be adopted by a jurisdiction. This information could be included in the 2003 Commentary to the IBC.  

E83-02  
1102.2, 1107.6.1.1, E102  

Proposed Change as Submitted:  

Proponent: Ken Schoonover, PE, KMS Associates, Inc.  

Revise as follows:  

E102.1 General. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein.  

TRANSIENT LODGING. A building, facility, or portion thereof, excluding inpatient medical care facilities and long-term care facilities, that contains one or more dwelling units or sleeping accommodations. Examples of transient lodging include, but are not limited to, resorts, group homes, hotels, motels, dormitories, homeless shelters, halfway houses and social service lodging.  

1102.1 (Supp) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the following meanings.  

TRANSIENT LODGING. A building, facility, or portion thereof, excluding inpatient medical care facilities and long-term care facilities, or detention or correctional facilities that contains one or more dwelling units or sleeping units. Examples of transient lodging include, but are not limited to, resorts, group homes, hotels, motels, dormitories, homeless shelters, halfway houses and social service lodging.
1107.6.1.1 (Supp) Accessible units. In occupancies in Group R-1 and Group R-2 transient lodging, accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1. All facilities on a site shall be considered to determine the total number of accessible units. Accessible units shall be dispersed among the various classes of units. Roll-in showers provided in accessible units shall include a permanently mounted folding shower seat.

Proponent's Reason: The intent of this proposal is to move the definition from the Appendix to Chapter 11 for coordination between Fair Housing and ADAAG requirements in facilities where they overlap. ADAAG would require dormitories, halfway houses, etc. to include accessible rooms.

Committee Action: Disapproved

Committee Reason: The Committee action on E104-02 will better address this issue.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Sarah A. Rice, Schirmer Engineering Corp. and John Berry of Cole & Russell, representing American Hotel & Lodging Association, requests Approved as Modified by this comment.

Modify proposal as follows:

1102.1 (Supp) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the following meanings.

TRANSIENT LODGING. A building, facility, or portion thereof, excluding inpatient medical care facilities and long-term care facilities, or detention or correctional facilities, where the occupants are transient in nature occupying the facilities for less than 30 days and that contain one or more dwelling units or sleeping units. Examples of transient lodging include, but are not limited to, resorts, group homes, hotels, motels, dormitories, homeless shelters, halfway houses and social service lodging.

1107.6.1.1 (Supp) Accessible units in transient lodging. In occupancies in Group R-1 occupancies used for transient lodging and Group R-2 transient lodging, accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1. All facilities on a site shall be considered to determine the total number of accessible units. Accessible units shall be dispersed among the various classes of units. Roll-in showers provided in accessible units shall include a permanently mounted folding shower seat.

Commenter's Reason: The Code Development Committee denied Code Change E83-02 in favor of Code Change E104-02. As the Committee Reason stated, the action to E104-02 better address this issue, e.g., number of accessible units in Group R-2 occupancies. With that action Section 1107.6.1.1 (Supp) will remain as it written in the 2002 Supplement requiring that "in occupancies in Group R-1, accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1."

Essentially, the IBC as modified by the 2002 Supplement now requires Group R-1 occupancies to have:

- A specific number of hotel rooms to be accessible (in accordance with Table 1107.6.1.1), and
- All hotel rooms must be Type B Units.

Though we agree with the Code Development Committee that the content of Code Change E104-02 does take care of the issue of accessible units in Group R-2 occupancies, we also agree with the proponent that the definition of "transient lodging," as proposed to be modified, is needed within the body of the code to add clarification which will allow the code user to know when to provide accessible dwelling and sleeping units in Group R-1 occupancies and when to provide Type B (adaptable) dwelling and sleeping units.

Without the some "time frame" associated with the definitions of "transient lodging" and "intended to be used as a residence" the code does not provide a clear distinction that as to when a building of Group R-1 occupancy should supply accessible only, adaptable only or a combination of both accessible and adaptable dwelling and sleeping units. Having a 30-day time frame in the definitions of "transient lodging" and "intended to be used as a residence" creates a clear distinction that will allow consistent application of the provisions in the IBC.

Most of the Model Codes have associated the term "transient" with a period of less than 30 days for a long time. It has been included in the BOCA National Building Code since 1984, the SBCCI Standard Building Code since 1988, the NFPA Life Safety Code since 1991, and the 2000 IBC.

It was only recently that the association of the term "transient" with a period of 30 days was deleted from the IBC (Code Change G34-00). The Committee Reason for acceptance of this code change was "for coordination with the Fair Housing Accessibility Guidelines...The proposed text is necessary for facilities that may be utilized for both transient and non-transient accommodations, such as an extended stay hotel, boarding house or dormitory." The sad fact of this is that HUD is not standing behind this stated intent.

To address the issue of application, this proposal seeks to add text that clearly differentiates between those sleeping rooms that are used by "transient" guests and those that are to be used by "extended stay" guests. Having a distinct period of time associated with the definitions of "transient lodging" and "intended to be occupied as a residence" allows for a uniform and reasonable application of the requirement.

Many interested parties have worked diligently to "harmonize" the IBC with both the FHA Guidelines and the ADAAG. But the issue of "scoping" as it relates to sleeping units in Group R-1 occupancies cannot be said to be an issue that can be "harmonized" at this time in the IBC as the entities that oversee these documents themselves HAVE NOT been harmonized.

At this time, the agencies charged with interpreting accessibility issues; HUD through the FHA Guidelines and DOJ through ADAAG, do not agree on the extent of the application of the requirement in the FHA Guidelines for sleeping units in Group R-1 occupancies, particularly for those in Group R-1 occupancies that are "intended to be occupied as a residence." Conversations with individuals at HUD have stated that the FHA Guidelines are ABSOLUTELY applicable to all sleeping rooms in all types of hotels. However, conversations with individuals at DOJ indicated the opposite that the FHA Guidelines were NEVER intended to apply to hotels that are not of the "extended stay" type. The question
many individuals are having is - does the DOJ even have the authority to determine the intent of the FHA Guidelines?

This is an issue of on-going debate and until this issue is solidly resolved it is inappropriate for the IBC to make a definitive statement on the application that could be radically different than the true intent. Being less restrictive cannot hurt as federal regulations will take precedence, but should the IBC contain language that is more restrictive than what is in the FHA Guidelines the IBC could find itself with a significant problem. If HUD or DOJ come to a consistent application/interpretation on this issue, it will by law take precedence over what the IBC says.

An interesting part of the interpretation from HUD is that it actually contradicts the commentary to the current FHA Guidelines that suggests that it was HUD’s intent to include only the “extended stay” lodging properties. However, the actual wording in the code does not contain language that accurately differentiates between sleeping units used as “transient lodging” and those that are “intended to be occupied as a residence.”

This proposal, in conjunction with the Public Comment to Code Change to E82-02, provide the language that can clean up and clarify the issue of when a dwelling unit or sleeping unit in a Group R-1 occupancy should be accessible or adaptable.

The fact that the FHA Guidelines do not contain the 30-day time frame in their definitions of “transient lodging” and “intended to be used as a residence” does not mean that the IBC should not.

Therefore we ask that the membership overturn the action of the Code Development Committee and Approve Code Change E83-02 as modified.

See also Public Comment to Code Change E82-02.

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**E85-02**

**1103.2.4**

*Proposed Change as Submitted:*

**Proponent:** Irvin J. Poke, AIA, State of Michigan; representing Bureau of Construction Codes, DCIS

**Add new text as follows:**

**1103.2.4 Containment areas.** Areas where spill control is required for the containment of hazardous materials in accordance with Section 414.5.5 are not required to be accessible.

**1103.2.5 Sterile environment.** Areas where access to a sterile environment would require airlocks, decontamination rooms or gowning procedures are not required to be accessible.

**Proponent’s Reason:** This is intended to add an exemption from accessibility for areas such as those requiring spill containment and rooms that have a need for clean or sterile environments. The architectural barriers required make it difficult to provide accessibility. Spill containment is generally accomplished by a system of uninterrupted perimeter barriers. The clean or sterile environments require transition, airlock, decontamination and gowning procedures. Elimination of barriers to allow wheelchair access could be considered technically infeasible and/or negate the purpose of the barrier.

**Committee Action:** Approved as Submitted

**Committee Reason:** The areas described in the new exceptions address problematic areas and are appropriate.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

**This item is on the agenda for individual consideration because a public comment was submitted.**

**Public Comment:**

Kermit C. Robinson, City of Portland Oregon, representing Oregon Building Officials Association, requests Disapproved.

**Commenter’s Reason:** The two exceptions approved in this code change are not present in either the current ADAAG or the ADAAG final draft. To approve these exceptions clearly takes the IBC out of compliance with the Federal regulations. The State of Oregon is mandated to provide accessibility code provisions that are at least as stringent as the Federal law. Similar regulations also apply in other States. In addition, all buildings are required to meet the ADAAG requirements, regardless of what is provided in the building codes. To approve these exceptions creates a hardship for the architects, engineers and building owners that are required to design and construct buildings that meet the ADAAG regardless of what is required by the building code. For these reasons, this code change should be disapproved.

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**E88-02**

**1103.2.8**

*Proposed Change as Submitted:*

**Proponent:** Irvin J. Poke, AIA, State of Michigan; representing Bureau of Construction Codes, DCIS

**Add new text as follows:**

**1103.2.8 Military, fire service and police facilities.** Areas intended for use and occupancy by military, fire service, police or security personnel are not required to be accessible.

**Proponent’s Reason:** This is intended to add an exemption for training, housing, toilet and bathing facilities that are for the use of the personnel identified. Military, fire service, police and security personnel are required to be physically fit by constitution, statute and/or job duties. To require these facilities to be accessible serves no practical purpose.
Committee Action: Disapproved

Committee Reason: As written, the exception covers the entire station. Dispatch and office areas can be staffed by personnel that may be disabled.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Irvin J. Poke, AIA, STATE OF MICHIGAN, representing DCIS Bureau of Construction Codes, requests Approved as Modified by this comment.

Modify proposal as follows:

1103.2.8 Military, fire service and police facilities. Housing, bathing, toilet, training and storage areas intended for use and occupancy exclusively by able-bodied military, fire service, police or security personnel are not required to be accessible.

Commenter’s Reason: This is intended to add an exemption for training, housing, toilet and bathing facilities that are for the use of the personnel identified. Military, fire service, police and security personnel are required to be physically fit by constitution, statute and/or job duties. To require these facilities to be accessible serves no practical purpose. The Means of Egress Committee stated that the original proposal was too broad. The areas of concern stated in the reasoning have been added to the text of the proposal to narrow the scope the exception to accessibility.

E90-02

1103.2.12

Proposed Change as Submitted:

Proponent: C. Angela Van Etten, Little People of America, Inc.

Revise as follows:

1103.2.1213 Fuel-dispensing systems. The operable parts on fuel-dispensing devices are not required to be accessible: shall comply with ICC/ANSI A117.1-1998, Section 308.2.1 or 308.3.1 or be made accessible by the use of alternative designs, products or technologies.

Proponent’s Reason:

a. The Gasoline Pump Manufacturers Association (GPMA) contends that the IBC was not intended to cover gas pumps. This claim is unsubstantiated and should not therefore be given any weight.

b. The current generation of dispensing devices meets a 54-inch reach standard irrespective of whether the device is mounted on an island or installed flush with the ground. Thus, there is no good reason to give dispensing devices a blanket exemption from accessibility. At least, they should be required to meet a 54-inch high reach standard.

c. The GPMA argues that gas pumps are not exempt from accessibility requirements because they are regulated by ADAAG’s 54-inch reach range standard. (See September 2001 comments on E61-01). However, a building code official is more likely to be familiar with the ready to enforce the IBC than ADAAG. Indeed, the official could exempt gas pumps from accessibility requirements based on the exception in Section 1103.2.12 and completely overtake the ADAAG height requirement.

d. Two out of three primary elements—the hose, fuel selection buttons, and credit card reader—in the current generation of dispensing devices meet ANSI’s 48-inch high reach range standard irrespective of whether the device is mounted on an island or installed flush with the ground. Thus, there is no good reason to exempt all three elements from the 48-inch high reach standard. At the least, the hose and fuel selection buttons should be required to meet a 48-inch high reach standard.

e. All elements—the hose, fuel selection button, and credit card reader-in the current generation of dispensing devices meet ANSI’S 48-inch high reach standard when the device is installed flush with the ground. According to the GPMA’s September 2001 comments on E61-01, “approximately two-thirds of gas station operators mount their gas pumps on standard six-inch concrete safety islands.” It can be inferred, therefore, that one-third of the nation’s gas pumps are installed flush with the ground. Thus, there is no good reason to exempt all dispensing devices from ANSI’S 48-inch high reach range standard when one-third of the devices can meet this standard.

f. There is no national safety rule that requires dispensing devices to be mounted on an island. Indeed, Section 2206.7.3 of the International Fire Code currently permits dispensing devices to be protected by mounting on a concrete island OR by guard posts or other approved physical barriers in accordance with Section 312, Vehicle Impact Protection.

g. According to Steve Robertson, Product Manager at Marconi Commerce Systems, speaking for the GPMA, no State requires that dispensing devices be mounted on an island.

h. It is recognized, however, that an individual local fire Marshall could direct that dispensing devices be mounted on an island.

i. In those jurisdictions where local officials mandate mounting dispensing devices on an island, the operable parts on dispensing devices should be designed to meet ANSI’S 48-inch high reach range standard and thereby be within the reach of half a million individuals with disabilities—individuals whose reach is limited due to height (dwarfism), spasticity (cerebral palsy), lack of arm strength, sitting or standing instability, poor balance, or limited upper body movement by wheelchair users—who cannot reach above 48 inches.

j. The GPMA does not argue that it is not feasible to design a dispensing device that would meet ANSI’S 48-inch high reach range standard when the device is installed on an island. Rather, the GPMA argues that this requirement would mandate a new design cycle for gas pumps. However, it is unreasonable for an industry to be excused from providing access, because it is unwilling to alter a design that is known to be inaccessible. Besides, in today’s highly competitive market and rapidly advancing technologies it is more than likely that the industry has designers dedicated to improving their equipment. Therefore, it is only reasonable that the industry be expected to have their designers work on improvements that include making their equipment more accessible.

k. The GPMA explains that requiring the operable parts on dispensing devices mounted on islands to comply with ANSI’S 48-inch high unobstructed reach range, means that the highest operable parts will be 42 inches. They complain that when such devices are installed flush with the ground these operable parts will be mounted at 36 inches and will create an “ergonomic disaster for many Americans of even average height.” Such a claim is totally unfounded and cannot be substantiated. Americans are already
acctustomed to reaching controls at the following heights: (1) 35 inches for the gas hose on a gas pump; (2) 35 inches to retrieve stamps from Postal machines; (3) 25 inches to retrieve change and receipts from a Postal machine; (4) 20 inches to retrieve change from a vending machine; and (5) 18 inches to retrieve merchandise from the bottom bin in a vending machine.

The proposed code language does not mandate that a redesign of the dispensing device involve a lowering of the operable parts. The language gives industry the option of providing access via alternative designs, products, or technologies. Such alternatives could include: a stand-alone credit card reader (such as those used by Arco), a wave transponder, a wireless business transaction, or some other means.

**Committee Action:** Approved as Modified

**Modify current text as follows:**

1103.2.12 Fuel-dispensing systems. The operable parts on fuel-dispensing devices are not required to be accessible. shall comply with ICC A117.1, Section 308.2.1 or 308.3.1

**Committee Reason:** It is not necessary to restate that alternative means are permissible, that is covered in Chapter 1. The reference to the reach range requirements in ICC is an appropriate limitation for these devices. Gas pump reach range is a technical requirement.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Glen R. Marshall, Risk Mitigation Consulting, LLC, representing the American Petroleum Institute, requests Approved as Modified by this comment.

Replace proposal with the following:

1103.2.12 Fuel-dispensing systems. Fuel-dispensing devices are not required to be accessible.

**Commenter’s Reason:**

1. Fuel dispenser configuration and regulation are not Building Code issues since access to control mechanisms is neither a “life safety” issue nor a building “egress” issue. Rather, it is a technical issue. If regulatory language regarding fuel dispensers is necessary, it should be placed within the International Fire Code (e.g., Section 312) or a code specific to service stations.

2. This specific issue has been presented and rejected three times in the past by both the IBC and the IMC (See IFC item F173-02).

3. Dispensing devices placed at ground level and protected per IFC Section 312 already satisfy the Americans with Disabilities Act (ADA) requirements and is allowable by the “alternative methods” language already in both the IFC and the ADA (ADA Title III Regulations, Part C, Section 36).

4. Most local jurisdictions and the ADA already allow self serve stations to provide full service (at self serve prices) to individuals with disabilities.

**E92-02**

1104.4

**Proposed Change as Submitted:**

**Proponent:** Brian Black, Eastern Paralyzed Veterans Association

**Revise as follows:**

1104.4 (Supp) Multilevel buildings and facilities. At least one accessible route shall connect each accessible level, including mezzanines, in multi-level buildings and facilities.

**Exceptions:**

1. An accessible route is not required to stories and mezzanines floors above and below accessible levels that have an aggregate area of not more than 3,000 square feet (278.7 m²). This exception shall not apply to:

   1.1 Multiple tenant facilities of Group M. occupancies containing five or more tenant spaces;

   1.2 Levels containing offices of health care providers (Group B or Group I); or

   1.3 Passenger transportation facilities and airports (Group A-3 or Group B).

   2. In Groups A, I, R and S occupancies, levels that do not contain accessible elements or other spaces required by Sections 1107 or 1108 are not required to be served by an accessible route from an accessible level.

**Proponent’s Reason:** The 300 square foot exception was originally established in the BCMC report as an “elevator exception”, recognizing that a passenger elevator can add significant costs for access to relatively small spaces. (ADAAG is more explicit in providing an exception to its requirement that elevators be provided in multi-story buildings.)

Unfortunately, the reference to “floors” and “levels” in the existing text suggests an exception other than that intended. For example, some have read this section to not require an accessible route to a 1,000 square foot space in a 4,000 square foot single story building that is one or two feet above the 3,000 square foot accessible level. In one case, a split-level office with 1,400 square feet on the lower floor and 1,400 square feet on the upper floor, both entered through a 100 square foot accessible grade-level lobby was considered eligible for this exception!

Referring to stories and mezzanines clarifies the original intent of the exception, that it is mean to compensate for the cost of elevators and not that inaccessible levels can be arbitrarily designed into buildings.

**Committee Action:** Approved as Submitted

**Committee Reason:** The proposed language clarifies the original intent of the BCMC report on this issue, that a mezzanine or a floor level is permitted to be exempt if it meets the 3,000 sq. ft. criteria.
Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Marsha K. Mazz, U.S. Access Board, representing U.S. Access Board, requests Approved as Modified by this comment.

Modify proposal as follows:

1104.4 Multilevel buildings and facilities. At least one accessible route shall connect each accessible level, including mezzanines, in multi-level buildings and facilities.

Exceptions:
1. An accessible route is not required to stories and mezzanines above and below accessible levels that have an aggregate area of not more than 3,000 square feet (278.7 m²). This exception shall not apply to:
1.1 Multiple tenant facilities of Group M occupancies containing five or more tenant spaces;
1.2 Levels containing offices of health care providers (Group B or Group I);
1.3 Passenger transportation facilities and airports (Group A-3 or Group B);
1.4 Buildings containing more than two stories; or
1.5 Buildings with 3,000 square feet (278.7 m²) or more per story.
2. In Groups A, I, R and S occupancies, levels that do not contain accessible elements or other spaces required by Sections 1107 or 1108 are not required to be served by an accessible route from an accessible level.

Commenter’s Reason: The Access Board encourages the membership to approve the committee’s actions on E92-02 with the amendment as shown above. Wherever possible, the Access Board is committed to harmonizing its guidelines with the IBC. However, this section contains provisions that would permit a building to violate not only the Access Board’s guidelines, but the ADA statute, itself. Exception 1 would permit a multistory building with an elevator to have a story or mezzanine less than 3,000 square feet with no vertical accessible route serving that level. Both the ADA statute and ADAAG require vertical access in buildings unless the building contains not more than three stories, or less than 3,000 square feet per story. Certain buildings, such as those that are designed or constructed “by or on behalf of a state or local government” are not eligible for this vertical access exception. Where vertical access is required, it cannot bypass mezzanines.

E95-02

1105.1

Proposed Change as Submitted:

Delete and substitute as follows:

1105.1 Required. At least 50 percent but not less than one entrance to each building and structure, and each separate tenant space within the building or structure, shall comply with the accessible route provisions of this chapter.

Exceptions:
1. Entrances to spaces not required to be accessible as provided for in Section 1107.
2. Loading and service entrances that are not the only entrance to a building or to a tenant space.

1105.2 Multiple accessible entrances. Where a building or facility has entrances that normally serve accessible parking facilities, transportation facilities, passenger loading zones, taxi stands, public streets and sidewalks, tunnels or elevated walkways, or accessible interior vertical access, then at least one of the entrances serving each such function shall comply with the accessible route provisions of this chapter.

1105.1 Required. Accessible entrances shall be provided in accordance with Sections 1105.2 through 1105.3.

1105.2 Public Entrances. In addition to accessible entrances required by 1105.2.1 through 1105.2.4, at least 75 percent of all public entrances shall be accessible. At least one accessible entrance shall be a ground floor entrance.

Exception:
1. An accessible entrance is not required to areas not required to be accessible.
2. Loading and service entrances that are not the only entrance to a tenant space.

1105.2.1 Parking Garage Entrances. Where direct access to a building or facility is provided for pedestrians from an enclosed parking garage, the entrances from the garage to the building shall be accessible.

1105.2.2 Entrances from Tunnels or Elevated Walkways. Where direct access is provided for pedestrians from a pedestrian tunnel or elevated walkway to a building or facility, at least one entrance to the building or facility from each tunnel or walkway shall be accessible.

1105.2.3 Restricted Entrances. Where restricted entrances are provided to a building or facility, at least
one restricted entrance to the building or facility shall be accessible.

1105.2.4 Entrances for Inmates or Detainees. Where entrances used only by inmates or detainees and security personnel are provided at judicial facilities, detention facilities, or correctional facilities, at least one such entrance shall be accessible.

1105.3 Tenant Spaces, Dwelling units and Sleeping units. At least one accessible entrance shall be provided to each tenancy, dwelling unit and sleeping unit in a facility.

Exceptions:
1. An accessible entrance is not required to tenants that are not required to be accessible.
2. An accessible entrance is not required to dwelling units and sleeping units that are not required to be accessible, Type A units or Type B units.

3408.7 Scoping for alterations. The provisions of Section 3408.7.1 through 3408.7.15 shall apply to alterations to existing buildings and facilities

3408.7.1 Entrances. Accessible entrances shall be provided in accordance with Section 1105.2 through 1105.9

Exception: Where an alteration includes alterations to an entrance, and the building or facility has an accessible entrance, the altered entrance is not required to be accessible, unless required by 3408.6. Signs complying with 1109 shall be provided.

(Renumber Section 3408.7.1 through 3408.7.14)

3408.8 Historic buildings. (no change)

3408.8.3 Entrances. At least one main entrance shall be accessible.

Exceptions:
1. If a main entrance cannot be made accessible, an employee or service an accessible non public entrance that is unlocked while the building is occupied shall be provided made accessible, or
2. If a main entrance cannot be made accessible, a locked accessible entrance with a notification system or remote monitoring shall be provided.

The accessible entrance shall have a notification system or be provided with remote monitoring. Signs complying with 1109 shall be provided at the primary entrance and at the accessible entrance.

Committee Action: Approved as Modified

Modify proposal as follows (No change to any part of the proposal not shown herein:)

1105.2 Public entrances: In addition to accessible entrances required by Sections 1105.2.1 through 1105.2.4, 1105.2.6, at least 75 percent of all public entrances shall be accessible. At least one entrance shall be a ground floor entrance.

Exceptions: (No change)

1105.2.1 Parking garage entrances: Where provided, direct access to a building or facility is provided for pedestrians from an enclosed parking garage structures to building or facility entrances the entrances from the garage to the building shall be accessible.

Add new: 1105.2.5 Service entrances: If a service entrance is the only entrance to a building or to a tenant space in a facility, that entrance shall be accessible.

Renumber: 4106.3 1105.2.6 Tenant spaces, dwelling units and sleeping units: (No change)

Add/redefine definitions:
Restricted entrance: An entrance that is made available for common use on a controlled basis but not public use and that is not a service entrance.

Public entrance: An entrance that is not a service entrance or a restricted entrance.

Committee Reason: While proposed ADAAG does require 60% accessible entrance, the proposed ADAAG comments do acknowledge that providing access to all entrances on a hilly site may be difficult. A maximum of 50% would address this difficulty in a two entrance building on a hilly or small site by requiring only one to be accessible. The current ADAAG ties the number of exits to the number of entrances. This has been identified as flawed scoping provisions, therefore, it was never picked up by IBC as a criteria.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:
Marsha K. Mazz, U.S. Access Board, representing U.S. Access Board, requests Approved as Modified by this comment.

Modify Section 1105.2 of the proposal as follows:

1105.2 Public entrances. In addition to accessible entrances required by Sections 1105.2.1 through 1105.2.6, at least 50 percent of all public entrances shall be accessible.

Exception:
1. An accessible entrance is not required to areas not required to be accessible.
2. Loading and service entrances that are not the only entrance to a tenant space.

Commenter’s Reason: The Access Board encourages the membership to approve the committee’s action on E95-02 with the amendment as shown above. The Access Board believes that the increase in the number of accessible entrances required from fifty percent to sixty percent is warranted to even approach equity in access for people with disabilities. Nothing in the code requires coordination between parking or other site arrival points and accessible entrances. For example, parking facilities are frequently provided in the rear of buildings while accessible entrances, when not all are accessible, are most often located in on the front of buildings. Increasing the likelihood that an entrance will be accessible is the only mechanism at our disposal to ensure that people with disabilities do not have to travel inordinately longer distances than others to gain admittance to buildings. Even where the federal rules require parking to be on the “shortest accessible route” to an entrance,” nothing in ADAAG (or IBC) can be interpreted to require the route to be the “shortest” route merely the “shortest accessible route.” The accessible route could be, and frequently is, around a city block when others have an inaccessible entrance steps away.

Public Comment 2:

Brian Black, Eastern Paralyzed Veterans Association, representing EPVA, requests Approved as Modified by this comment.

Modify Section 1105.2 of the proposal as follows:

1105.2 Public entrances. In addition to accessible entrances required by Sections 1105.2.1 through 1105.2.6, at least 50 percent of all public entrances shall be accessible.

Exceptions:
1. An accessible entrance is not required to areas not required to be accessible.
2. Loading and service entrances that are not the only entrance to a tenant space.
3. Where a building has only two public entrances, a single accessible entrance shall be permitted.

Commenter’s Reason: The original modification to E95-02 to increase the number of accessible public entrance from 50 percent to 60 percent was offered to harmonize with the 2002 ADAAG draft. Floor testimony and committee discussion against this change focused solely on the impact this would have on small, 2-entrance buildings (requiring both to be accessible), and the change was disapproved for this condition alone. [As a member of the committee, I voted for disapproval for just this reason.]

Adding an exception for buildings with only two public entrances resolves the concerns that were raised, while harmonizing the requirements for all other buildings with the draft ADAAG. It will increase accessibility for some buildings (with 4, 6, 8 etc. entrances) while insuring that designers and owners of those buildings will meet their federal ADA obligations.

Public Comment 3:

Marsha K. Mazz, U.S. Access Board, representing U.S. Access Board, requests Approved as Modified by this comment.

Modify Section 1105.2.6 of the proposal as follows:

1105.2.6 Tenant Spaces, Dwelling units and Sleeping units At least one accessible entrance shall be provided to each tenancy, dwelling unit and sleeping unit in a facility.

Exceptions:
1. An accessible entrance is not required to areas not required to be accessible.
2. An accessible entrance is not required to dwelling units and sleeping units that are not required to be Accessible units, Type A units or Type B units.
3. An accessible entrance is not required to dwelling units and sleeping units that are not required to be Accessible units provided that at least one entrance door provides a clear opening 32 inches (815 mm) wide minimum.

Commenter’s Reason: The Access Board encourages the membership to approve the committee’s action on E95-02 with the amendment as shown above. The change will harmonize this IBC section with the existing requirements in the ADAAG at 9.4 Other Sleeping Rooms and Suites.

Analysis to Public Comment #3: Section 1107 requires Accessible units in Groups I and R-1. In exception 3, a question would be if the 32” clear width at doors was not already addressed by Section 1003.3.1.1.

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E104-02
1107.6.2

Proposed Change as Submitted:

Proponent: Brian Black, Eastern Paralyzed Veterans Association

Revise as follows:

1107.6.2 (Supp) Group R-2. Accessible units, Type A units and Type B units shall be provided in occupancies in Group R-2 in accordance with Sections 1107.6.2.1 and 1107.6.2.2.

1107.6.2.1 Apartment houses, monasteries and convents. Type A and Type B units shall be provided in apartment houses, monasteries and convents in accordance with Sections 1107.6.2.1.1 and 1107.6.2.1.2.
1107.6.2.1.1 (Supp) Type A units. In occupancies in Group R-2 containing more than 20 dwelling units or sleeping units, at least 2 percent, but not less than one, of the units shall be a Type A unit. All units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units.

Exceptions:
1. The number of Type A units is permitted to be reduced in accordance with 1107.7.
2. Existing structures on a site shall not contribute to the total number of units on a site.

1107.6.2.1.2 Type B units. Where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.6.2.2 Boarding houses, dormitories, fraternity houses and sorority houses. Accessible units and Type B dwelling units shall be provided in boarding houses, dormitories, fraternity houses and sorority houses in accordance with Sections 1107.6.2.2.1 and 1107.6.2.2.2.

1107.6.2.2.1 Accessible units. Accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1.

1107.6.2.2.2 Type B units. Where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and every sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

Proponent’s Reason: A number of code changes were approved in the 2001 Supplement, based on work with the Department of Housing and Urban Development to establish equivalency with the Fair Housing Amendments Act. Inadvertently, the accessible units required for boarding houses, dormitories, fraternities and sororities were replaced with “adaptable” Type A units in the process. This resulted in a lower level of access than that required by ADAAG, bringing the IBC out of the harmonization achieved in 2000.

This code change returns the requirements for accessible units to conform with ADAAG while retaining the equivalency with the Fair Housing requirements.

Committee Action: Approved as Modified

Modify proposal as follows (no change to any part of the proposal not shown herein):

1107.7-1107.7.5

Proposed Change as Submitted:

Proponent: Irvin J. Poke, AIA, State of Michigan; representing Bureau of Construction Codes, DCIS

Revise as follows:

1107.7 (Supp) General exceptions. Where specifically permitted by Sections 1107.5 or 1107.6, the required
number of Type A and Type B units is permitted to be reduced in accordance with Sections 1107.7.1 through 1107.7.5.

1107.7.1 (Supp) Buildings Structures without elevator service. Where no elevator service is provided in a building structure, only the dwelling and sleeping units that are located on stories indicated in Sections 1107.7.1.1 and 1107.7.1.2 are required to be Type A and Type B units. The number of Type A units shall be determined in accordance with Section 1107.6.2.

1107.7.1.1 (Supp) One story with Type B units required. At least one story containing dwelling units or sleeping units intended to be occupied as a residence shall be provided with an accessible entrance from the exterior of the building structure and all units intended to be occupied as a residence on that story shall be Type B units.

1107.7.1.2 (Supp) Additional stories with Type B units. On all other stories that have a building structure entrance in proximity to arrival points intended to serve units on that story, as indicated in items 1 and 2, all dwelling units and sleeping units intended to be occupied as a residence served by that entrance on that story shall be Type B units.

1. Where the slopes of the undisturbed site measured between the planned entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance are 10% or less, and

2. Where the slopes of the planned finished grade measured between the entrance and all vehicular or pedestrian arrival points within 50 feet of the planned entrance are 10% or less.

Where no such arrival points are within 50 feet (15 240 mm) of the entrance, the closest arrival point shall be used unless that arrival point serves the story required by Section 1107.7.1.1.

1107.7.2 (Supp) Multistory units. A multistory dwelling or sleeping unit which is not provided with elevator service is not required to be a Type B unit. Where a multistory unit is provided with external elevator service to only one floor, the floor provided with elevator service shall be the primary entry to the unit, shall comply with the requirements for a Type B unit, and a toilet facility shall be provided on that floor.

1107.7.3 (Supp) Elevator service to the lowest story with units. Where elevator service in the building structure provides an accessible route only to the lowest story containing dwelling or sleeping units intended to be occupied as a residence, only the units on that story which are intended to be occupied as a residence are required to be Type B units.

1107.7.4 (Supp) Site impracticality. On a site with multiple non-elevator structures buildings, the number of units required by Section 1107.7.1 to be Type B units is permitted to be reduced to a percentage which is equal to the percentage of the entire site having grades, prior to development, which are less than 10 percent, provided that all of the following conditions are met:

1. Not less than 20 percent of the units required by Section 1107.7.1 on the site are Type B units; and

2. Units required by Section 1107.7.1, where the slope between the building structure entrance serving the units on that story and a pedestrian or vehicular arrival point is no greater than 8.33 percent, are Type B units, and

3. Units required by Section 1107.7.1, where an elevated walkway is planned between a building entrance serving the units on that story and a pedestrian or vehicular arrival point and the slope between them is 10 percent or less are Type B units, and

4. Units served by an elevator in accordance with 1107.7.3 are Type B units.

1107.7.5 (Supp) Base flood elevation. The required number of Type A and Type B units shall not apply to a site where the lowest floor or the lowest structural building members of non-elevator structures buildings are required to be at or above the base flood elevation resulting in:

1. A difference in elevation between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm) exceeding 30 inches (762 mm), and

2. A slope exceeding 10 percent between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm).

Where no such arrival points are within 50 feet (15 240 mm) of the primary entrances, the closest arrival point shall be used.

Proponent’s Reason: The intent of this proposal is to replace the word “building” with “structure” in the Type A & B unit exceptions. Code change E73-01 adds up all units on a site to determine the number of Type A units required. Where Type B units are required, the number of units are evaluated on a structure by structure basis, regardless of the presence of fire walls. Using the term “building” in the exceptions for Type B units is inconsistent with terminology in the previous sections and could be misinterpreted. The current text could be
interpreted to permit the use of fire walls to create separate buildings and thus avoid accessibility requirements. Use of the term “structure” would be consistent with Fair Housing requirements.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason. The change is consistent with HUD’s understanding of building vs. structure and would add clarity to the requirements.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lawrence G. Perry, AIA, representing BOMA International, requests Disapproved.

Commenter’s Reason: The proposal, while seeking to coordinate the IBC terms with those of Fair Housing, undoes a critical piece of several years of work. Following several years of task group work, in 2000 an extensive series of code change proposals were submitted and approved that made the IBC equivalent with Fair Housing. The current IBC text has been deemed by HUD to offer a safe harbor for compliance with Fair Housing; there is no omission or conflict with current federal requirements.

The only critical use of the term “Structure” in lieu of “building” from FHAG is already in the IBC; the provision that four or more units in a structure triggers application of the FHAG/Type B requirements. The remaining text, that this proposal modifies, was specifically crafted so that it could use the more common building code term “building” instead of “structure”. Simply changing the term from building to structure substantially changes the intent – in some cases making the code more restrictive than FHAG, and in some cases more lenient than FHAG.

If rewritten as proposed, 1107.7.1 would require elevator service to dwelling units where an apartment building was connected to an office building that contained an elevator, even if firewalls created separate buildings. HUD has indicated that was never their intent to the “structure” approach. The revisions to 1107.7.1.1 and 1107.7.3 would create a reduction in accessibility, as it would only require units on one story of the structure to be Type B units. Where multiple buildings, separated by firewalls step up a site, the current code would “capture” one floor of each building. As revised, only on floor of the “structure” is covered.

Revising this text without official concurrence from HUD that it is still equivalent with Fair Housing will raise a serious question as to whether the IBC will still be a “safe harbor” for Fair Housing compliance.

Proponent: Ken Schoonover, PE, KMS Associates, Inc.

1. Revise subsection as follows:

1108.2 (Supp) Assembly area seating. Assembly areas with fixed seating shall comply with Sections 1108.2.1 through 1108.2.4.1 1108.2.5. Dining areas shall comply with Sections 1108.2.6 through 1108.2.6.2.

2. Add new subsection (renumber 1108.2.5 and its subsections to 1108.2.6):

1108.2.5 Performance areas. An accessible route shall be provided where a circulation path directly connects a performance area to an assembly seating area. An accessible route shall be provided from performance areas to ancillary areas or facilities used by performers.

Proponent’s Reason: The purpose of this proposal is to add new text for consistency with proposed ADAAG. The reason is that the IBC is currently does not contain this requirement and is not equivalent to ADAAG on this matter. The general provisions that require all spaces to be connected by an accessible route unless otherwise exempted cannot be relied upon to convey this intent. The inclusion of this provision from proposed ADAAG will make the intent more clear and will to consistency between the IBC and ADAAG.

Committee Action: Approved as Modified

Editorial note: A modification package to proposals E108-02, E111-02, E112-02 and E113-02 was approved by the Committee. The modification package is reported in E108-02 only.

Modify proposal as follows (no change to any part of the proposals not shown herein):

Modify the existing text as follows (E108-02):

1108.2 (Supp) Assembly area seating: Assembly areas with fixed seating shall comply with Sections 1108.2.1 through 1108.2.4.1

1108.2.6. Dining areas shall comply with Sections 1108.2.6 through 1108.2.6.2.

Modify proposal as follows (E111-02):

1108.2.2 (Supp) Wheelchair spaces: Number and location: In theaters, bleachers, grandstands, stadiums, arenas, and other fixed seating assembly areas, accessible wheelchair spaces complying with ICC A117.1 shall be provided in accordance with 1108.2.2. Table 1108.2.2. At least one seat for a companion shall be provided beside each wheelchair space.

Add new text:

1108.2.2.1 General seating: Wheelchair spaces shall be provided in accordance with Table 1108.2.2.

Modify proposal as follows (E111-02):

TABLE 1108.2.2 (Supp) ACCESSIBLE WHEELCHAIR SPACES
CAPACITY OF SEATING IN ASSEMBLY AREAS | MINIMUM REQUIRED NUMBER OF WHEELCHAIR SPACES
---|---
4 to 25 | 1
26 to 50 | 2
51 to 150 | 4
151 to 300 | 5
301 to 500 | 6
Over 500
501 to 5,000 | 6, plus 1 for each 499, 150, or fraction thereof, over 500 between 501 through 5,000
5,001 and over | 36 plus 1 for each 200, or fraction thereof, over 5,000

Add new text:

1108.2.2.2 Luxury boxes, club boxes, and suites in arenas, stadiums, and grandstands: In each luxury box, club box, and suite within arenas, stadiums, and grandstands, wheelchair spaces shall be provided in accordance with Table 1108.2.2.

1108.2.2.3 Other boxes: In boxes other than those required to comply with Section 1108.2.2.2, the total number of wheelchair spaces provided shall be determined in accordance with Table 1108.2.2. Wheelchair spaces shall be located in not less than 20 percent of all boxes provided.

1108.2.3 Integration: Wheelchair spaces shall be an integral part of the seating plan.

1108.2.5 Companion seats: At least one companion seat complying with ICC A117.1 shall be provided for each wheelchair space required by 1108.2.2.

Modify the proposal as follows (E108-02):

1108.2.8 Performance areas. An accessible route shall be provided directly connect the performance area to the assembly seating area where a circulation path directly connects a performance area to an assembly seating area. An accessible route shall be provided from performance areas to ancillary areas or facilities used by performers.

Delete current text:

3408.7.7 Assembly areas: Seating shall adjoin an accessible route that also serves as a means of egress. Where it is technically infeasible to disperse accessible seating throughout an altered assembly area, the minimum required number of wheelchair space clusters shall be one-half of that required by Section 1107.2.2.1. In existing assembly seating areas with a mezzanine, where the main level provides three-fourths or more of the total seating capacity, wheelchair space clusters are permitted to be dispersed on the main level. Each accessible seating area shall have provisions for companion seating.

Committee Reason: Original testimony and questions brought out the following information about the proposal: Provisions include the removal of the clustering requirements. Companion seats are not required to be fixed. Criteria is provided for designated aisle seating: There is a reduction in the number of wheelchair seats required. Luxury boxes are addressed on a per box basis, not cumulative.

Committee comments to improve the proposal as part of the public comment process were as follows: While some of the technical requirements for dispersion are found in the ICC A117.1-1998, some of the technical requirements for dispersion will be addressed only in ICC A117.1-2003, which may not be published in time to be referenced by the IBC 2003. The language of the first sentence of Section 1108.2.8 is confusing. The term “integral” in Section 1108.2.3 is interpretive.

The committee chose to accept the modification package for the following reasons: While some of the language is subjective, it does address many issues that have been brought up in the past. A formula that is viable for all venues is not available at this time. The proposed text improves on the existing criteria.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Brian Black, Eastern Paralyzed Veterans Association, representing EPVA, requests Approved as Modified by this comment.

Modify proposal as follows:

1108.2 (Supp) Assembly area seating. Assembly areas with fixed seating shall comply with Sections 1108.2.1 through 1108.2.8. Dining areas shall comply with Sections 1108.2.9 through 1108.2.9.2.

Add the following:

1108.2.2.3 – Exterior seating. Where lawn seating and exterior overflow seating areas are provided, wheelchair spaces shall be provided in those areas.

Commenter’s Reason: A modification to harmonize with the 2002 ADAAG draft was proposed in the spring hearings, stating: “Lawn seating areas and exterior overflow seating areas, where fixed seats are not provided, shall connect to an accessible route complying with ICC/ANSI A117.1.” This sentence was disapproved by the committee, assuming the code should not address lawn seating.

The committee was incorrect in this assumption. Performing arts centers are designed, and tickets are sold with a specific occupant load assumed for lawn and overflow seating. The plumbing code establishes minimum fixture requirements based on the anticipated occupancy of the entire venue, not just those seats located in the structural part of the center. (Zoning requirements will also require parking based on the anticipated total attendance in a venue, not just the number of seats in the covered area.) Ignoring lawn seating, which often constitutes over half the total seating in a venue, would also skew the scoping applications of Table 1108.2.2 and cause a deficiency in the total number of wheelchair spaces provided.

Lawn seating can be qualitatively different than seating in a structure. Tickets are typically sold as general seating and not reserved seating, often at a different price. Amenities may be different. Acoustics are different (and sometimes better). Just as the E111-02 code changes specify dispersion of wheelchair spaces into luxury boxes, the code must require dispersion of wheelchair spaces into the exterior seating locations.

Note that deleting the word “fixed” from 1108.2 will have an effect on other types of venues. This is intentional. There are many
performance assembly areas that do not contain fixed seats (theater-in-the-round, dinner theater) that nonetheless should provide access for persons who use wheelchairs, and this change will correct this problem. The term “fixed” is in the current IBC only because it appears in the ICC/ANSI A117.1 text; the A117 Accredited Standards Committee has removed the word from its 2003 draft document, and the IBC voting membership should follow suit.

This code change will provide substantial equivalence with ADAAG. It will provide greater access for persons who use wheelchairs and insure that building owners and designers meet their federal ADA obligations.

**E110-02**  
1108.2.2, 1110.3

*Proposed Change as Submitted:*

*Proponent:* Shahriar Amiri, Montgomery County, MD; representing self

*Revise as follows:*

1108.2.2 (Supp) *Wheelchair spaces.* In theaters, bleachers, grandstands and other fixed seating assembly areas, accessible wheelchair spaces shall be provided in accordance with Table 1108.2.2. Designated aisle seats shall be provided in accordance with Section 1108.2.4 through 1108.2.4.3. At least one seat for a companion shall be provided beside each wheelchair space.

1108.2.4 *Designated Aisle Seats.* Designated aisle seats shall be provided in all assembly areas.

*Exception:* Designated aisle seats are not required in luxury boxes, club boxes or suites.

1108.2.4.1 *Number.* One designated aisle seat per 100 seats or fraction thereof shall be provided.

1108.2.4.2 *Location.* At least one of each four required designated aisle seats shall be located on an accessible route. All other required designated aisle seats shall be located not more than two rows from an accessible route serving such seats.

1108.2.4.3 *Configuration.* Removable or folding armrests shall be provided on the aisle side of the designated aisle seats.

1110.3 (Supp) *Other signs.* Signage indicating special accessibility provisions shall be provided as shown:

1. In assembly areas required to comply with Section 1108.2.4, a sign notifying the general public of the availability of assistive listening systems shall be provided at ticket offices or similar locations.
2. At each door to an exit stairway, signage shall be provided in accordance with Section 1003.2.10.3.
3. At areas of refuge, signage shall be provided in accordance with Section 1003.2.13.5.3 through 1003.2.13.5.5.
4. At areas for assisted rescue, signage shall be provided in accordance with Section 1003.2.13.7.3.
5. In assembly areas required to comply with Section 1108.2.4, each designated aisle seat shall be identified by a sign marker. Signs notifying patrons of the availability of designated aisle seats shall be posted at the ticket office.

*Proponent’s Reason:* The purpose of the proposed change is for coordination with proposed ADAAG, Section 221.4 Designated aisle seats and 802.8 Designated aisle seats. It is necessary to include Section 802.8 because the ANSI A117.1 does not include technical information on designated aisle seats.

*Committee Action:* Disapproved

*Committee Reason:* Designated aisle seating technical criteria belongs in the ICC A117.1. Only scoping criteria for designated aisle seats belongs in the IBC.

*Assembly Action:* No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment 1:*

Marsha K. Mazz, U.S. Access Board, representing U.S. Access Board, requests Approved as Modified by this comment.

Replace the entire proposal with the following:

1108.2.6 *Designated aisle seats.* At least five percent, but not less than one, of the total number of aisle seats provided shall be designated aisle seats.

*Commenter’s Reason:* At the Pittsburgh hearings we submitted a proposal to add criteria for designated aisle seats as a modification to E110. The proposal included both technical and scoping provisions. The Committee disapproved the modification because the ANSI A117.1 Standard did not include technical provisions for designated aisle seats. At its May 2003 meeting, the ANSI Committee voted to include such technical standards in its committee recommendations for the 2nd Public Review Draft. Inclusion of this requirement will harmonize the IBC and the ANSI Standard with the Draft ADAAG.

*Public Comment 2:*
Brian Black, Eastern Paralyzed Veterans Associations, representing EPVA, requests Approved as Modified by this comment.

Replace the entire proposal with the following:

1108.2.6 Designated aisle seats. At least five percent, but not less than one, of the total number of aisle seats provided shall be designated aisle seats. Required designated aisle seats shall be the aisle seats located closest to accessible routes.

Commenter’s Reason: A modification to E110-02 was offered by the proponent to harmonize with the requirements of the 2002 ADAAG draft. It was disapproved because it included technical criteria for designated aisle seats that were simultaneously being considered by the ANSI A117 Accredited Standards Committee.

The ICC/ANSI A117.1-2003 Public Draft now includes these technical criteria, and the proposed 1108.2.6 above includes only the scoping requirements appropriate for the IBC. Approval of this change will increase accessibility for persons who use canes, crutches and walkers while insuring that building owners and designers comply with their federal ADA obligations.

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E118-02

1109.2

Proposed Change as Submitted:

Proponent: Bruce Pitts, Grand Rapids, MI; representing 7% of the USA population having paruresis

Revise as follows:

1109.2 (Supp) Toilet and bathing facilities. Toilet rooms and bathing facilities shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing facilities provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing facility shall be accessible.

Exceptions:

1. In toilet rooms or bathing facilities accessed only through a private office, not for common or public use, and intended for use by a single occupant, any of the following alternatives are allowed:
   1. Doors are permitted to swing into the clear floor space provided the door swing can be reversed to meet the requirements in ICC A117.1,
   2. The height requirements for the water closet in ICC A117.1 are not applicable,
   3. Grab bars are not required to be installed in a toilet room, provided that the reinforcement has been installed in the walls and located so as to permit the installation of such grab bars,
   1.4 The requirement for height, knee and toe clearance shall not apply to a lavatory.

2. This section is not applicable to toilet and bathing facilities that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.

3. Where multiple single-user toilet rooms or bathing facilities are clustered at a single location and contain fixtures in excess of the minimum required number of plumbing fixtures, at least 5 percent, but not less than one room for each use at each cluster, shall be accessible.

4. Toilet room fixtures that are in excess of those required by the plumbing code and that are designated for use by children in day care and primary school occupancies.

Proponent’s Reason: By requiring all clustered toilets to be accessible via Exception 3, the code is not fair for the construction of clustered restrooms. Unless this section is changed, litigation may be the only way to force architects to eliminate the communal restroom and build ALL accessible clustered restrooms (this is a major expense).

By following my web site and only requiring UPC guidelines as to the number of accessible toilets needed based upon occupancy, private, clustered restrooms actually cost less to build and give architects every incentive to go this route.

Requiring all clustered toilets to be accessible is similar to requiring all parking spaces in a parking lot to be accessible. This is not done nor should Exception 3 remain in print requiring something like this.

Private restrooms will replace communal restrooms whether the change is made to Exception 3 now or in the future. Until then, Paruresis suffers like myself may have to resort to the legal system to force architects to spend additional money to make ALL clustered toilets accessible.

Whatever the reason used to write Exception 3 in the past, providing 17 million Americans accessible private restrooms where they can function normal lives is and will become a major priority. This is reason enough to change Exception 3.

Please change Exception 3 of Section 1109.2. Communal restroom elimination will become big news now that Paruresis is out in the open. Paruresis sufferers are being educated to their disability, their legal rights in building construction, along with their presently being denied access to private restrooms.

Committee Action: Disapproved

Committee Reason: The original intent of Section 1109.2, Exception 3 is to address drug testing facilities or truck stops where a large number of single occupant bathrooms may be clustered and the bathrooms are in addition to the required fixture count. It was suggested that a better place to handle this might be with the new required Unisex toilet rooms.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual
consideration because a public comment was submitted.

Public Comment:

Bruce Pitts, representing self, requests Approved as Public Comment: submitted.

Commenter’s Reason: The 2002 Report of the Public Hearing on the 2000 Editions of the ICC Codes, Section E118-02 states that “The original intent on 1109.02, Exception 3 is to address drug testing facilities or truck stops...”. This may be true, yet if ONLY clustered toilet rooms are used in an architectural building design (with NO communal restrooms), as Exception No. 3 is presently written, interpretation can be that ALL multiple single-user toilet rooms clustered at a single location shall be accessible. My proposed removal of the words “and contain fixtures in excess of the minimum required number of plumbing fixtures” alleviates any question as to ALL multiple single-user toilet rooms clustered at a single location having to be accessible.

The "Paruresis and Architects" web site (http://architectsandparuresis.homestead.com/architectsandparuresis.html) defines this disability and proposes design changes that will help paruresis sufferers. Also, the Americans With Disabilities Act states that a person is “considered to have a disability if he or she has a physical or mental impairment that substantially limits one or more major life activities.”

Modifications to Proposal E118-02 allows architects to design private restrooms with approximately 30 to 40% less square footage than it now costs to design communal restrooms. Proposal E118-02 is actually an evolutionary change in that it is a better and cheaper way to build public toilet rooms, and it also helps millions of people with Paruresis function in society. Denying paruresis sufferers access to private toilet rooms leads to agoraphobia, inability to work, SSI Disability Claims, increased unemployment, etc. Workplace labeling, bullying and firing can also result.

One of the April 13 Board member’s suggestion that paruresis sufferers wait until a communal restroom is cleared of people prior to entering is an unworkable solution for this disability. The same logic would hold true of telling a wheel-chaired individual to wait until people are out of a communal restroom so he or she can actually fit the wheelchair into that space. A paruresis sufferer having to wait around for the communal restroom to clear out could actually increase his or her exposure to workplace labeling, bullying and firing.

Staff Comment:

Enclosures were
Architects and Paruresis web site content and
Social Phobia Subtypes in the National Comorbidity Survey.
by: Ronald C. Kessler, Ph.D.
Harvard University Medical School
Murray B. Stein, M.D.
University of California, San Diego
Patricia Berglund, M.B.A.
University of Michigan
April, 1997

E119-02

1109.2

Proposed Change as Submitted:

Proponent: Brian Black, Eastern Paralyzed Veterans Association

Revise as follows:

1109.2 (Supp) Toilet and bathing facilities. Toilet rooms and bathing facilities shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing facilities provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing facility shall be accessible.

Exceptions:

1. thru 3. (No change)

4. Toilet room fixtures that are in excess of those required by the plumbing code and that are designated for use by children in day care and primary school occupancies.

Committee Reason:

Proponent’s Reason: ICC/ANSI A117.1-2003 has requirements for children’s environments. This exception is no longer needed or appropriate.

Modify proposal as follows:

Modify proposal as follows:

1109.2 (Supp) Toilet and bathing facilities: Toilet rooms and bathing facilities shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing facilities provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing facility shall be accessible.

Exceptions:

1 to 3 (no change)

4. Toilet room fixtures that are in excess of those required by the plumbing code and that are designated for use by children in day care and primary school occupancies.

5. Where no more than one urinal is provided in a toilet room or bathing facility, the urinal is not required to be accessible.

6. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be accessible.

1109.8.3 Coat hooks and folding shelves: Where coat hooks and folding shelves are provided in inaccessible toilet rooms, toilet compartments, or in dressing, fitting or locker rooms, at least one of each type shall be provided in accessible and shall be provided in accessible toilet rooms without toilet compartments, accessible toilet compartments, and accessible dressing, fitting and locker rooms.

Committee Reason: Retain current Exception 4, the deletion is not justifiable unless the ICC A117.1-2003 is available since the ICC A117.1-1998 does not include child size information. The new exceptions 5 and 6 were approved as part of the coordination effort with ADAAG. The reduction in accessible fixtures that they represent is appropriate.
1109.2.1 Unisex toilet and bathing rooms. In assembly and mercantile occupancies, an accessible unisex toilet room shall be provided where an aggregate of six or more male and female water closets are required. In building s of mixed occupancy, only those water closets required for the assembly or mercantile occupancy shall be used to determine the unisex toilet requirement.

Exception: Where each separate-sex bathing room has only one shower or bathtub fixture, a unisex bathing room is not required.

Committee Action: Disapproved

Committee Reason: Justification is required for the increase in cost of adding single occupant toilet room to all use groups. The Committee would like to see some of the studies to verify the 7% of the population having paruresis disability.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bruce Pitts, representing Self, requests Approved as this comment.

Replace proposal with the following:

1109.2.1 Unisex toilet and bathing rooms. In Groups A, B, E, F, I, M and R assembly and mercantile occupancies, an accessible unisex
A toilet room shall be provided where an aggregate of six or more male and female water closets are required. In buildings of mixed occupancy, only those water closets required for the specified assembly or mercantile occupancies shall be used to determine the unisex toilet requirement. In recreational facilities where separate-sex bathing rooms are provided, an accessible unisex bathing room shall be provided. Fixtures located within unisex toilet and bathing rooms shall be included in determining the number of fixtures provided in an occupancy.

Exceptions:
1. Where each separate-sex bathing room has only one shower or bathtub fixture, a unisex bathing room is not required.
2. In Groups I and R where single occupant toilet rooms are provided for each dwelling units or sleeping units, unisex toilet rooms are not required.

Commenter’s Reason: For Section #1109.2.1, my April 13, 2002 proposal suggests that the words “in assembly and mercantile occupancies” and “In buildings of mixed occupancy, only those water closets required for the assembly or mercantile occupancy shall be used to determine the unisex toilet requirement” be removed. This allows for paruresis sufferers (see attached web site “Paruresis and Architects”) to have access to private toilet rooms in more than just assembly and mercantile occupancies. I am willing to modify this proposed change to EXCLUDE the following Use and Occupancy Classifications as outlined in Chapter 3 of the International Building Code: Classification #5 High Hazard, Section #6 Residential, Section #9 Storage and Section #10 Utility and Miscellaneous.

On April 13, 2002, in order to substantiate my changes to Proposals E 118-02 and E 120-02 (above), the Board asked to see the mentioned Study pertaining to approximately 7% of the American population having the Paruresis disability. On a survey of 8098 respondents ages 15 to 54 (see P. 4, Part II. METHODS), Table #1 (see P. 19) of the attached Social Phobia Subtypes in the National Comorbidity Survey indicates 6.6% of the National population have a fear of using a toilet away from home (unable to urinate in the presence of others for many or most of these individuals).

Staff Comment:
Enclosures were
Architects and Paruresis web site content and
Social Phobia Subtypes in the National Comorbidity Survey.
by: Ronald C. Kessler, Ph.D.
Harvard University Medical School
Murray B. Stein, M.D.
University of California, San Diego
Patricia Berglund, M.B.A.
University of Michigan
April, 1997

E121-02
1109.3

Proposed Change as Submitted:

Proponent: Brian Black, Eastern Paralyzed Veterans Association

Revise as follows:

1109.3 Sinks. Where sinks are provided, at least 5 percent, but not less than one, provided in accessible spaces shall comply with ICC/ANSI A117.1.

Exceptions:
1. Mop or service sinks are not required to be accessible.
2. Sinks designated for use by children in day care and primary school occupancies.

Proponent’s Reason: ICC/ANSI A117.1-2003 has requirements for children’s environments. This exception is no longer needed or appropriate.

Committee Action: Approved as Modified

Modify proposal as follows:

1109.3 Sinks: (no change to existing text)

1109.4 Kitchens, and kitchenettes and wet bars. Where kitchens and kitchenettes and wet bars are provided in accessible spaces or rooms, they shall be accessible in accordance with ICC A117.1.

Committee Reason: The ICC A117.1-1998 does not include child size requirements. The ICC A117.1-2003 which does include child sizes may not be available within this code change cycle, therefore the Exception 2 in Section 1109.3 should be retained. Deletion of the wet bar in Section 1109.4 is appropriate since it is a type of sink.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Marsha K. Mazz, U.S. Access Board, representing U.S. Access Board, requests Approved as Modified by this comment.

Modify proposal as follows:

1109.3 Sinks. Where sinks are provided, at least 5 percent, but not less than one, provided in accessible spaces shall comply with ICC/ANSI A117.1.

Exceptions:
1. Mop or service sinks are not required to be accessible.
2. Sinks designated for use by children in day care and primary school occupancies.

Commenter’s Reason: The Committee disapproved this proposal because the ANSI A117.1 Standard did not include technical provisions for sinks for children’s use. At its May 2003 meeting, the ANSI Committee voted to include such technical standards in its committee recommendations for the 2nd Public Review Draft. Inclusion of this requirement will harmonize the IBC with the Draft ADAAG. ADAAG has included provisions for sinks that are accessible to children since 1998.
**E123-02**

**1109.7**

Proposed Change as Submitted:

PropONENT: Brian Black, Eastern Paralyzed Veterans Association

Revise as follows:

1109.7 (Supp) Lifts. Platform (wheelchair) lifts shall not be a part of a required accessible route in new construction.

Exceptions: Platform (wheelchair) lifts are permitted for:
1. An accessible route to a performing area in occupancies in Group A.
2. An accessible route to wheelchair spaces required by Section 1108.2.2.
3. An accessible route to spaces that are not open to the general public with an occupant load of not more than five.
4. An accessible route within a dwelling or sleeping unit.
5. An accessible route to wheelchair seating spaces located in outdoor dining terraces in A-5 occupancies where the means of egress from the dining terraces to a public way is open to the outdoors.

Proponent’s Reason: This allowance for lifts in courtrooms harmonizes with the ADAAG requirements for judicial facilities.

Committee Action: Approved as Modified

Editorial note: The section number change in Exception 2 of the modification correlates with the modifications to E108/E111/E112/E113.

Modify proposal as follows:

1109.7 (Supp) Lifts. Platform (wheelchair) lifts shall not be a part of a required accessible route in new construction.

Exceptions: Platform (wheelchair) lifts are permitted for:
1. An accessible route to a performing area in occupancies in Group A.
2. An accessible route to wheelchair spaces required by Section 1108.2.2.
3. An accessible route to spaces that are not open to the general public with an occupant load of not more than five.
4. An accessible route within a dwelling or sleeping unit.
5. An accessible route to wheelchair seating spaces located in outdoor dining terraces in A-5 occupancies where the means of egress from the dining terraces to a public way is open to the outdoors.

Commenter’s Reason: The only instance where the word “infeasible” occurs in the IBC is in the requirements for accessibility in existing buildings where allowances are made for situations where full compliance is “technically infeasible”. “Technically Infeasible” is a defined term and is limited to structural or site constraint that limit the ability to alter a preexisting building or element.

Exception #7 is immediately flawed in two ways. It applies the concept of “infeasible” to new construction, whereas the BCMC Accessibility Report and three model code groups specifically limited it to existing conditions. Worse, it does not limit infeasibility to technical issues, inviting arguments over what is infeasible while providing no direction to the code enforcement official. When does something become financially infeasible? Can something be aesthetically infeasible? Ramps or elevators may become infeasible simply due to poor design. This should not be permitted.

This exception also suffers from the law of unintended consequences. Unlike previous model codes, Section 1003.2.13.4 Platform lifts permits wheelchair lifts to be part of an accessible means of egress where they are permitted as part of an accessible route. This was done explicitly because lifts are allowed so rarely in new construction and typically serve tiny occupant loads. It was felt that the life safety risk was negligible where lifts would be part of an accessible means of egress from a courtroom witness stand or a small projection booth. However, this exception could result in lifts on accessible means of egress serving hundreds of occupants and numerous persons with mobility impairments. The lift could be installed in the building interior, with no fire and smoke separation, no adjacent area of refuge, no travel limitations on the lift. If three or four people who cannot use stairs have to wait for this lift (with a typical speed of 8 ft/min) to evacuate the
building, injuries or fatalities will result.

E128-02
Chapter 35

Proposed Change as Submitted:

Proponents: Gregory L. Harmon, Accessibility Equipment Manufacturers Association and Brian Black, Eastern Paralyzed Veterans Association

Revise as follows:

Chapter 35
REFERENCED STANDARDS

(Supp)

ICC A117.1-9803 Accessible and Usable Buildings and Facilities

Proponents' Reasons:

Harmon: This change brings the IBC up to date with the latest Standard affecting Platform Lifts. Lifts are no longer contained in ASME A17.1. The A18.1 ‘a’ addenda brings the Standard up to date with current technology and is more representative of what is and has been permitted in the various jurisdictions. Also found within the latest Standard are provisions that make lifts more user friendly as the removal of the requirement for keyed controls. This change will not add any cost and in some applications will reduce cost.

Black: Adoption of the newest edition of the standard will advance harmonization with the new ADAAG.

Committee Action: Approved as Modified

Modify the existing text as follows:


Committee Reason: The Committee was provided with the latest version of ASME A18.1-99 with the A18.1a-2001 Addenda. The ICC A117.1-2003 is not yet available. Thus only the ASME standard update was approved.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Modify the current text as follows:

ICC A117.1-982003 Accessible and Usable Buildings and Facilities

Ken Schoonover's Reason: It is essential that the 2003 IBC reference the 2003 A117.1 in order to match all of the revised scoping that will be adopted this cycle with the revised technical provisions that the A117 Committee is developing. While all of the steps involved in the ANSI process may not be completed at the time of the Ft. Worth hearing, the technical issues will have been considered and it is anticipated that the new standard will receive official ANSI approval before the 2003 IBC is published and ready for distribution. This action will ensure that on the subject of accessibility, the IBC will remain the most progressive and up-to-date code of any of the codes that may be on the street in the near future.

Gene Boecker's Reason: The code change was the subject of much debate regarding how to word the requirements for wheelchair seating. The result was that the accepted modifications did not include details of seat spacing but only the reference to the A117.1 document. The ANSI committee has taken it upon itself to offer a viable concept for wheelchair seating dispersion within a theatre. The draft is not yet out for review as this comment is being written but the draft, as described in correspondence, presents a mechanism for wheelchair spacing that is more extensive than that which can easily be placed in the building code. Since the referenced standard would contain the appropriate language for wheelchair spacing, the best thing that can happen is to acknowledge the attempts of the code change proponent and author of the modifications by updating the code to reference the edition of the standard that has the text missing from the code.

NATO supports the concepts in the draft A117.1 text although we reserve the right to comment further on the finalized text which is not yet published. By the time the ICC annual meeting is held the finalized text will be available for review by the public.

E137-02
1002 (IFC 1002)

Proposed Change as Submitted:

Proponent: David W. Cooper, Stairway Manufacturers Association

Add new text as follows:

SECTION 1002


DEFINITIONS

WINDER. A tread with non-parallel edges in its width.

Proponent’s Reason: Webster’s dictionary defines a winder as a tread in a winding stairway and a fler as a tread in a straight stairway. Although the ICC has no definition for winder it is clearly self evident that a winder is a type of tread not a type of stairway. Winder treads are used as components of stairs that change direction, just as fliers (straight treads) are components in straight stairs. A winder performs the same function as a tread but its shape allows the additional function of a gradual turning of the stairway direction. The tread depth of a winder at the walk line and the minimum tread depth at the narrow end can control the turn made by each winder.

Winder treads are found as components of many types of stairways that turn, circular, elliptical, spiral, and an infinite array of curved and geometrical winding configurations. These would be impossible to regulate as stairway types, if there were codes that could be applied. This infinite variety of stairway types are encountered as part of the building environment on a daily basis and the current code at best causes confusion and varying interpretations. The definition of the winder will add a key element that is missing from the code. This element can form the basis for regulations that can be applied to any turning stair.

It is the proponents desire to simplify the code language and reduce the confusion associated with regulating safe stair design and construction for all stairs by seeking to establish concise control of the two parameters that affect all stairs those being rise and tread depth at the walk line. Simple code language that regulates these two parameters will eliminate the need to regulate a plethora of stair types, which is the current direction of the code. Someone once said at a recent code hearing that you couldn’t build an elliptical stair because there is no code for it but you can build a circular stair because there is a code for it. I believe the speaker was trying to point out an oversight of the present code. Safe stairways can easily be designed within the shape of an ellipse. Simple code language that regulates these two parameters will eliminate the need to regulate a plethora of stair types, which is the current direction of the code. 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Analysis: See RB23-02 for same proposed change to the IRC. See RB53-02 and RB61-02 for proposed changes referenced in the reason statement.
Proposed Change as Submitted:

Proponent 1: John Morgan, City of Florissant, MO; representing Missouri Association of Building Officials and Inspectors

Proponent 2: Russell Todd, City of St. Louis, MO; representing Missouri Association of Building Officials and Inspectors

Revise as follows:

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

Reason: The purpose of this code change is to delete the code provision that would allow an appeal on the basis of "undue hardship". The provision cannot be enforced, as the meaning of "undue hardship" is not defined in the code. Such ambiguous provision should be deleted.

Committee Action: Approved as Submitted

Committee Reason: Deletes the subjective provision "undue hardship" that was undefined.

Assembly Action: No Motion

PM11-02

302.8

Proposed Change as Submitted:

Proponent: Ronald R. Jones, CBO; representing SBCCI Property Maintenance Code Action Committee

Revise as follows:

302.8 Motor vehicles. Except as provided for in other regulations, no inoperative or unlicensed motor vehicle or water craft shall be parked, kept or stored on any premises, and no vehicle or water craft shall at any time be in a state of major disassembly, disrepair, or in the process of being stripped or dismantled. Painting of vehicles or water craft is prohibited unless conducted inside an approved spray booth. The provisions of this section include devices used to transport motor vehicles or water crafts.
Exception: A vehicle or water craft of any type is permitted to undergo major overhaul, including body work, provided that such work is performed inside a structure or similarly enclosed area designed and approved for such purposes.

Reason: Water craft and related vehicles are not addressed in the code. The proposed change will clarify the text to include both vehicles.

Committee Action: Approved as Submitted
Committee Reason: To add the provision for inoperative or unlicensed water crafts in addition to motor vehicles including devices used to transport water crafts or motor vehicles.

Assembly Action: No Motion

Individual Consideration Agenda
This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:
Rick Davidson, City of Hopkins, requests Approved as Modified by this comment.

Modify proposal as follows:

302.8 Motor vehicles. Except as provided for in other regulations, no inoperative or unlicensed motor vehicle, or water craft, all-terrain vehicle, snowmobile, tent or travel trailer, or truck camper shall be parked, kept or stored on any premises, and no vehicle, or water craft, all-terrain vehicle, snowmobile, tent or travel trailer, or truck camper shall at any time be in a state of major disassembly, despair, or in the process of being stripped or dismantled. Painting of vehicles, or water craft, all-terrain vehicles, snowmobiles, tent or travel trailers, or truck campers is prohibited unless conducted inside an approved spray booth. The provisions of this section include devices used to transport motor vehicles, or water craft, all-terrain vehicles, snowmobiles, tent or travel trailers, or truck campers.

Exception: (No change to current text)

Commenter’s Reason: All terrain vehicles, snowmobiles, tent or travel trailers, and truck campers should not be excluded from the regulations that apply to a water craft.

305.2.2 Refrigerators. Refrigerators and similar equipment shall not be discarded, abandoned or stored on premises accessible to children without first removing the doors.

Reason: The proposed code change was developed by a technical subcommittee created by the New York State Fire Prevention and Building Code Council. The subcommittees consisted of representatives of local communities and code enforcement and state government representatives reviewing the International Property Maintenance Code as part of the adoption process for incorporation into a New York State Uniform Code.

The committee reviewed all aspects of the 2000 IPMC along with the current State code. The committee identified the matter of abandoned refrigerators for additional consideration as an ICC code change.

This particular subject is not provided for in the 2000 IPMC. However, it has been a requirement of a New York State Building Code since 1967 or earlier. The addition of section 305.2.2 Refrigerators is needed for the IPMC to provide a continued level of safety from the potential hazard of refrigerators and similar equipment being discarded with the risk of having children being able to get inside such equipment and becoming trapped.

The proposed code change will not increase the cost of construction nor require the use of any professional services.

Committee Action: Approved as Modified

Modify proposal as follows:

305.2.2 Refrigerators. Refrigerators and similar equipment not in operation shall not be discarded, abandoned or stored on premises accessible to children without first removing the doors.

Committee Reason: Provides a safety requirement for discarded refrigerators and appliances. The modification further defines the type of discarded refrigerators and deletes the subjective terms "accessible to children".

Assembly Action: No Motion

Individual Consideration Agenda
This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:
Ronald R. Jones, City of Gulfport, MS, requests Disapproved.

Commenter’s Reason: This proposed amendment should not be in the code because it is not a building code issue, nor is it a building code maintenance issue. If it’s in the code, then the code administrative professionals must enforce it. What happens if a child gets injured or killed in one of the refrigerators? It could appear that the code professionals are liable because we let the condition exist. If this is mandated in the IPMC with the expressed purpose of preventing someone (children) from becoming trapped inside and through no ones negligence someone does become trapped because the door was not removed, who will be held responsible? The professionals responsible...
for executing the IPMC.

Highly educated, highly motivated and surprisingly creative practitioners operate our legal system. Therefore, I urge the committee to reconsider their position and disapprove PM16-02.
INTERNATIONAL ZONING CODE

Z5-02
801.4.5

Proposed Change as Submitted:

Proponent: Robert G. Boyer, CBO, Palm Beach County Building Division; representing SBCCI Code Action Committee

1. Revise as follows:

801.4.5 Screening of parking areas. A 3-foot-high (914 mm) buffer at the public way shall be provided for all parking areas of five or more parking spaces. Screening of parking areas shall be in accordance with Section 801.4.5.1 and 8014.5.2.

2. Add new text as follows:

801.4.5.1 Parking areas with five or more parking spaces. Along the street right of way perimeter in parking areas with five or more parking spaces, there shall be a landscaped screen. The screen shall be a minimum of five feet (1524 mm) in width and shall contain a continuous planting of shrubs maintained at a height of 30 inches (762 mm) within such a strip or within 5 feet (1524 mm) of the parking lot paving perimeter as it faces a street right of way. A tree shall be planted every 25 lineal feet of fraction thereof within this strip. Along all other perimeters of parking areas with five or more parking spaces there shall be a landscape strip a minimum of five feet (1524 mm) wide and a tree planted every 25 lineal feet.

801.4.5.2 Parking areas with more than thirty parking spaces. In addition to the perimeter screening requirements in Section 801.4.5.1, continuous parking areas containing thirty or more parking spaces shall have interior screening consisting of islands 90 square feet (8.36 m²) in area with a minimum dimension of 5 feet (1524 mm). Interior screening shall be a minimum of 6% of total paved area and shall be uniformly distributed throughout the interior of the paved area. Each island shall contain appropriate ground cover and a minimum of one tree. Interior screening shall be located a minimum of 40 feet (12 192 mm) from perimeter screening.

SECTION 202
DEFINITIONS

SCREENING. A method of reducing or shielding the impact of one use to another or reducing the impact of features within a development to surrounding areas.

Reason: Parking lot screening requirements are currently very vague.
EC3-02

101.4.2.1

Proposed Change as Submitted:

Proponent: John Terry, representing the International Existing Building Code Drafting Committee

Revise as follows:

101.4.2.2 Additions, alterations or repairs. Additions, alterations, renovations or repairs to a building envelope, mechanical, service water-heating, electrical distribution or illumination system or portion thereof shall conform to the provisions of the International Existing Building Code and this code, as applicable, as they relate to new construction without requiring the unaltered portion(s) of the existing system to comply with all of the requirements of this code. Additions, alterations or repairs shall not cause any one of the aforementioned and existing systems to become unsafe, hazardous or overloaded.

101.4.2.3 Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures specifically identified and classified as historically significant by the state or local jurisdiction, listed in The National Register of Historic Places or which have been determined to be eligible for such listing, historic buildings.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the International Building Code, ICC Electrical Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, or the International Plumbing Code or the International Existing Building Code, such terms shall have meanings ascribed to them as in those codes.

SECTION 202

GENERAL DEFINITIONS

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

Proponent’s Reason: The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.

The proposed code change submitted here is a part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

Definition of repair now similar to IEBC. 201.3: the International Existing Building Code is added as many terms related to existing buildings such as those discussed under 101.4.2.2 are found in the IEBC.

Committee Action: Disapproved

Committee Reason: The IEBC is still in draft form and not ready to replace sections of this code. The IEBC is not as diligent in addressing building additions and replacement windows as the IECC. The definition of “historic buildings” is not consistent with the IBC definition.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Terry, State of New Jersey, representing the IEBC Drafting Committee, requests Approved as Submitted.

Commenter’s Reason: This code change was originally Disapproved. The International Energy Conservation Code Development Committee in their reason stated that the “IEBC is still in draft form”. Contrary to the reported reason for Disapproval, the IEBC is, in fact, complete and is undergoing maintenance of provisions in the 2002 Cycle, just like all the I-codes. In recognition of this fact, the IBC General Committee approved code change proposal G133, that replaces the current text of 2000 IBC chapter 34, Existing Structures, with a reference to the IEBC. The IEBC Drafting process was very similar to the process used to develop the IBC; a committee developed a draft(s) which was then exposed to the rigors of the ICC Code Development Process. The 2003 IEBC will be part of the 2003 family of International Codes. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.

The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001. The IEBC addresses building additions in section 906 by requiring additions to conform to the requirements of the International Energy Conservation Code. The IEBC addresses replacement windows in section 401.2 by requiring replacement windows (repairs) to use material permitted by the IECC for new construction or like materials such that no hazard to life, health or property is created.

The IEBC Drafting Committee respectfully requests the membership approval of this public comment (AS)

EC10-02

Figures 301.1(1) through 301.1(51)
**Proposed Change as Submitted:**

**Proponent:** Steve Cattaneo, City of Fayetteville, AR, representing the SBCCI IECC Code Action Committee

Relocate Figures 302.1(1) through 302.1(51) to an appendix in the back of the IECC.

**Proponent’s Reason:** Relocating the maps to the rear of the code will make the code more user friendly. The relocation will allow the user of code to more easily find code language without having to flip through all of the seldom used maps.

**Committee Action:** Approved as Modified

Modify proposal as follows:

Relocate Figures 302.1(1) through 302.1(51) to an appendix in the back of a new Chapter 10 in the IECC.

**Committee Reason:** Based on proponent’s published reason. The modification creates a separate chapter for the maps instead of placing them in an appendix.

**Assembly Action:** Disapproved

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because an assembly action was successful.

_________________________

**EC18-02**

**502.1.4.1 (IRC N1101.3.2)**

**Proposed Change as Submitted:**

**Proponent:** John Hogan, representing the City of Seattle, WA

THIS PROPOSAL IS ON THE AGENDA OF THE IECC AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. **IECC 502.1.4.1 Window and door assemblies.** Window and door assemblies installed in the building envelope shall comply with the maximum allowable infiltration air leakage rates in Table 502.1.4.1.

   **Exception:** Site-constructed windows and doors sealed in accordance with Section 502.1.4.2.
TABLE 502.1.4.1
ALLOWABLE INFILTRATION AIR LEAKAGE RATES

<table>
<thead>
<tr>
<th>Windows (cfm per square foot of window area)</th>
<th>Doors (cfm per square foot of door area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3&lt;sup&gt;b,c,e&lt;/sup&gt;</td>
<td>0.3&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>0.5&lt;sup&gt;d,e&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 cfm/ft<sup>2</sup> = 0.00508 m<sup>3</sup>/(h-m<sup>2</sup>).

a. When tested in accordance with ASTM E 283.
b. See AAMA/WDMA 101/I.S.2.
c. See ASTM D 4099.
d. Requirement based on assembly area.
e. See NFRC 400.

502.1.4.2 Caulking and sealants. (no changes)

601.3.2.2 Air leakage. The air leakage of prefabricated fenestration shall be determined in accordance with AAMA/WDMA 101/I.S.2 or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer and shall not exceed the values in Table 502.1.4.1. Alternatively, the manufacturer shall certify that the fenestration is installed in accordance with Section 502.1.4.

802.3 Air leakage. The requirements for air leakage shall be as specified in Sections 802.3.1 and 802.3.2.

802.3.1 Window, door, and curtainwall assemblies. The air leakage of window, sliding or swinging doors, and curtainwall assemblies that are part of the building envelope shall be tested and listed as meeting determined in accordance with AAMA/WDMA 101/I.S.2 or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer and shall not exceed the values in Table 502.1.4.1.

Exceptions:
1. Site-constructed windows and doors that are weatherstripped or sealed in accordance with Section 802.3.2.

2. Commercial glazed swinging entrance doors and revolving doors shall have a maximum air infiltration leakage rate of 4.75 1.00 cubic feet per minute (cfm)/ft<sup>2</sup> (32.9 18.3 m<sup>3</sup>/h-m<sup>2</sup>) of door area when tested in accordance with ASTM E 283.

CHAPTER 9
REFERENCED STANDARDS

NFRC  National Fenestration Rating Council, Inc.
       Suite 120
       1300 Spring Street Park, Suite 500
       Silver Spring, MD 20910
       400-2001  Procedure for Determining Fenestration

CHAPTER 43
REFERENCED STANDARDS

NFRC  National Fenestration Rating Council, Inc.
       Suite 120
       1300 Spring Street Park, Suite 500
       Silver Spring, MD 20910
       400-2001  Procedure for Determining...
Fenestration Product Air Leakage

N1101.3.2.2

Proponent’s Reason: Revise text for consistent terminology.
Revise text for consistent SI conversion factors.
Add NFRC 400 as an allowable means to demonstrate compliance with air leakage criteria as it uses ASTM E 283 as its basis like the other standards referenced.
Revise commercial door air leakage rates to correspond with ASHRAE/IESNA Standard 90.1.
Update to current standards.

ITEM 1 (IECC)
Committee Action: Approved as Modified

Modify proposal as follows:

IECC 502.1.4.1 Window and door assemblies. Window and door assemblies installed in the building envelope shall comply with the maximum allowable air leakage rates in Table 502.1.4.1.

Exception: Site-constructed windows and doors sealed in accordance with Section 502.1.4.2.

<table>
<thead>
<tr>
<th>Windows (cfm per square foot of window area)</th>
<th>Doors (cfm per square foot of door area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sliding</td>
<td>Swinging</td>
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<td>0.3ante</td>
<td>0.3</td>
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<tr>
<td>0.5ante</td>
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</tr>
</tbody>
</table>

For St: 1 cfm/ft² = 18.3 m³/(h-m²).

a. When tested in accordance with ASTM E 283.
b. See AAMA/WDMA 101/I.S.2.
c. See ASTM D 4099.
d. Requirement based on assembly area.
e. See NFRC 400.

502.1.4.2 Caulking and sealants. (no changes)

601.3.2.2 Air leakage. The air leakage of prefabricated fenestration shall be determined in accordance with AAMA/WDMA 101/I.S.2 or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer and shall not exceed the values in Table 502.1.4.1. Alternatively, the manufacturer shall certify that the fenestration is installed in accordance with Section 502.1.4.1.

802.3 Air leakage. The requirements for air leakage shall be as specified in Sections 802.3.1 and 802.3.2.

802.3.1 Window, and door, and curtainwall assemblies. The air leakage of window and sliding or swinging doors, and curtainwall assemblies that are part of the building envelope shall be determined in accordance with AAMA/WDMA 101/I.S.2 or NAFS-1 or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer and shall not exceed the values in Table 502.1.4.1.

Exceptions:
1. Site-constructed windows and doors that are weatherstripped or sealed in accordance with Section 802.3.2.
2. Commercial entrance doors shall have a maximum air infiltration rate of 1.75 cubic feet per minute (cfm)/ft² (32.9 m³/h-m²) of door area when tested in accordance with ASTM E 283.

802.3.2 Curtainwall, storefront glazing, and commercial entrance doors. Curtainwall, storefront glazing, commercial glazed swinging entrance doors and revolving doors shall be tested for air leakage at 1.57 psf (.75 Pa) in accordance with ASTM 283. For curtainwalls and storefront glazing, the maximum air leakage rate shall be 0.3 cfm/ft² (5.5 m³/h-m²) of fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate shall be 1.00 cubic feet per minute (cfm)/ft² (18.3 m³/h-m²) of door area when tested in accordance with ASTM E 283.

CHAPTER 9 REFERENCED STANDARDS

NFRC National Fenestration Rating Council, Inc.
1300 Spring Street, Suite 500
Silver Spring, MD 20910

400-2001 Procedure for Determining Fenestration Product Air Leakage .................... 502.1.4.1, 601.3.2.2, 802.3.1

Committee Reason: The proposed standards are needed to provide guidance in the code for air leakage testing. The modifications move curtainwalls to a new section with storefront glazing and commercial doors and add NAFS-1, contingent on its
Suggested Scoping Modification of Item 2 for coordination with committee modification of Item 1. See page vi for procedural details.

(no change to N1101.3.2 or N1101.3.2.1)

N1101.3.2.2 Air leakage. The air leakage of prefabricated fenestration shall be determined in accordance with AAMA/WDMA 101/I.S.2, NAFS-1, or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer and shall not exceed the values in Table 502.1.4.1 of the International Energy Conservation Code. Alternatively, the manufacturer shall certify that the fenestration is installed in accordance with Section 502.1.4 of the International Energy Conservation Code.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
Item 1 AM Item 2 AM
or
Item 1 AS Item 2 AS
or
Item 1 d Item 2 D

The NAFS-1-02 standard was submitted for staff review during the Public Comment phase. Staff review demonstrated compliance with Section 3.6 of the ICC code development process with the following exception: the standard was developed under a consensus process but final approval by ANSI has not been received.

EC19-02

502.2.1.2

Proposed Change as Submitted:

Proponents: Jonathan Humble, AIA, representing the American Iron and Steel Institute
David D. Lovich, PE, representing Owens Corning

Revise as follows:

502.2.1.2 (Supp) Roof/ceiling. The combined thermal transmittance value \(U_o\) of the gross area of the roof or ceiling assembly shall not exceed the value given in Table 502.2. Equation 5-5 shall be used to determine acceptable combinations to meet this requirement.

\[
U_o = \frac{U_R x A_R + (U_S x A_S)}{A_o} \quad \text{(Equation 5-5)}
\]

\(U_o\) = The average thermal transmittance of the gross roof/ceiling area, \(\text{Btu}/\text{h} \cdot \text{ft}^2 \cdot \text{EF} \cdot (\text{W}/(\text{m}^2 \cdot \text{K}))\)

\(A_o\) = The gross area of the roof/ceiling assembly, \(\text{ft}^2 \) [\(\text{m}^2\)]

\(U_R\) = The combined thermal transmittance of the various paths of heat transfer through the opaque roof/ceiling area, \(\text{Btu}/\text{h} \cdot \text{ft}^2 \cdot \text{EF} \cdot (\text{W}/(\text{m}^2 \cdot \text{K}))\)

\(A_R\) = Opaque roof/ceiling assembly area, \(\text{ft}^2 \) [\(\text{m}^2\)]

\(U_o\) = The combined thermal transmittance of the area of all skylight elements in the roof/ceiling assembly (see Section 502.2.1.2.1), \(\text{Btu}/\text{h} \cdot \text{ft}^2 \cdot \text{EF} \cdot (\text{W}/(\text{m}^2 \cdot \text{K}))\)

\(A_s\) = The area (including frame) of all skylights in the roof/ceiling assembly (see Section 502.2.1.2.1), \(\text{ft}^2 \) [\(\text{m}^2\)]

Notes:
(1) When more than one type of roof/ceiling and/or skylight is used, the \(U\) and \(A\) terms for those items shall be expanded into their subelements as:

\((U_{R1} x A_{R1}) + (U_{R2} x A_{R2}) + \ldots \text{etc} \quad \text{Equation 5-6}\)

(2) Access doors or hatches in a roof/ceiling assembly shall be included as a subelement of the roof/ceiling assembly.

(3) When the roof/ceiling assembly contains cold-formed steel truss framing, the \(U_r\) value to be used in Equation 5-5 shall be determined by Equation 5-7.1, 5-7.2, or 5-7.3. These equations apply to cold-formed steel truss roof framing spaced at 24 inches (609 mm) on-center and where the penetrations through the cavity insulation do not exceed three (3) penetrations for each 4 foot (1,220 mm) length of the truss.

For constructions without foam between the gypsum board and bottom chord of the steel truss use:

\[
U_R = \frac{1}{0.864 x R_{ins} + 0.330} \quad \text{(Equation 5-7.1)}
\]
where:

\[ R_{\text{ins}} = \text{The R-value of the cavity insulation,} \]
\[ \text{h ft}^2 \cdot \text{EF/Br}u \ [\text{m}^2 \cdot \text{K/W}] \]

For constructions with R-3 foam between the gypsum board and bottom chord of the steel truss use:

\[
U_R = \frac{1}{0.864 \times R_{\text{ins}} + 4.994} \quad \text{(Equation 5-7.2)}
\]

For constructions with R-5 foam between the gypsum board and bottom chord of the steel truss use:

\[
U_R = \frac{1}{0.864 \times R_{\text{ins}} + 7.082} \quad \text{(Equation 5-7.3)}
\]

**Exception:** Overall system tested \( U_R \) values for roof/ceiling assemblies from approved laboratories, when such data are acceptable to the building official.

(4) When the roof/ceiling assembly contains C-shaped cold-formed joist/rafter steel framing, the \( U_R \) value to be used in equation 5-5 shall be determined using Equation 5-8 as follows:

\[
U_R = \frac{1}{R_s + (R_{\text{ins}} + F_{\text{cor}})} \quad \text{(Equation 5-8)}
\]

where:

\[ R_s = \text{The total thermal resistance of the elements of roof/ceiling construction, in a series along the path of heat transfer, excluding the cavity insulation and the steel framing,} \]
\[ \text{h ft}^2 \cdot \text{EF/Br}u \ [\text{m}^2 \cdot \text{K/W}] \]

\[ R_{\text{ins}} = \text{The R-value of the cavity insulation,} \]
\[ \text{h ft}^2 \cdot \text{EF/Br}u \ [\text{m}^2 \cdot \text{K/W}] \]

\[ F_{\text{cor}} = \text{The correction factor listed in Table 502.2.1.2, dimensionless} \]

**Exception:** Overall system tested \( U_R \) values for roof/ceiling assemblies from approved laboratories, when such data are acceptable to the building official.

**TABLE 502.2.1.2**
CORRECTION FACTORS (\( F_{\text{cor}} \)) FOR ROOF/CEILING ASSEMBLIES

\[ a \]


<table>
<thead>
<tr>
<th>MEMBER SIZE&lt;br&gt;</th>
<th>SPACING OF FRAMING MEMBERS (INCHES)</th>
<th>CAVITY INSULATION R-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R-19</td>
</tr>
<tr>
<td>2x4</td>
<td>16 o.c.</td>
<td>0.90</td>
</tr>
<tr>
<td>2x6</td>
<td></td>
<td>0.70</td>
</tr>
<tr>
<td>2x8</td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>2x10</td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>2x12</td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>2x4</td>
<td>24 o.c.</td>
<td>0.95</td>
</tr>
<tr>
<td>2x6</td>
<td></td>
<td>0.78</td>
</tr>
<tr>
<td>2x8</td>
<td></td>
<td>0.44</td>
</tr>
<tr>
<td>2x10</td>
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<td>0.44</td>
</tr>
<tr>
<td>2x12</td>
<td></td>
<td>0.44</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

a. Linear interpolation for determining Correction Factors which are intermediate between those given in the table is permitted.
b. Applies to steel framing members up to a maximum thickness of 0.064 inches (16 gage).

Proponent’s Reason: The IECC does not contain provisions in Chapter 5 for roof/ceiling envelope assemblies containing truss type or C-shaped cold-formed steel framing. This proposal is intended to compliment the requirements of the IECC with provisions that allow a user to analyze roof/ceiling envelope assemblies containing truss type or C-shaped cold-formed steel framing.

The values in the equations and table have been derived from steady-state hot box apparatus tests that were conducted by Owens Corning - Science and Technology Center (tests conducted 1995-1999) and by Oak Ridge national Laboratory-Building Technology Center (tests conducted 2000-2001). The hot box apparatus tests consisted of: (a) full scale cold-formed steel truss framed assemblies that were tested with various levels of insulation located in the cavity portion and above the framing members, and that were tested with various numbers of intermediate framing members penetrating the insulation and, (b) full scale C-shape cold-formed steel framing roof/ceiling assemblies that were tested with various levels of insulation located in the cavity portion and above the framing members. By combining our efforts in assessing the results of the tests we have found that the calculations for roof/ceilings containing wood truss framing would not be appropriate for determining the overall performance of roof/ceiling envelopes containing cold-formed steel framing.

Units have been added to the definition of the terms in the equations to be consistent with other equations in the code.

We therefore present the equations and correction factor table to provide a way for users to analyze envelope roof/ceiling assemblies that contain truss type or C-shaped cold-formed steel framing.

Committee Action: Approved as Modified

Modify proposal as follows:

502.2.1.2 (Supp) Roof/ceiling. The combined thermal transmittance value (\(U_o\)) of the gross area of the roof or ceiling assembly shall not exceed the value given in Table 502.2. Equation 5-5 shall be used to determine acceptable combinations to meet this requirement.
For constructions without foam between the gypsum board and bottom chord of the steel truss use:

\[
U_R = \frac{1}{0.864xR_{ins} + 0.330} \tag{Equation 5-7.1}
\]

where:

\[R_{ins} = \text{The R-value of the cavity insulation, } \text{h} \cdot \text{ft}^2 \cdot \text{EF/Brtu [m}^2 \cdot \text{K/W]}\]

For constructions with R-3 foam between the gypsum board and bottom chord of the steel truss use:

\[
U_R = \frac{1}{0.864xR_{ins} + 4.994} \tag{Equation 5-7.2}
\]

For constructions with R-5 foam between the gypsum board and bottom chord of the steel truss use:

\[
U_R = \frac{1}{0.864xR_{ins} + 4.994} \tag{Equation 5-7.3}
\]

**Exception:** Overall system tested \(U_R\) values for roof/ceiling assemblies from approved laboratories, when such data are acceptable to the building official.

(4) When the roof/ceiling assembly contains C-shaped cold-formed joist/rafter steel framing, the \(U_R\) value to be used in equation 5-5 shall be determined using Equation 5-8 as follows:

\[
U_R = \frac{1}{R_S + \left( R_{ins} \times F_{cor} \right)} \tag{Equation 5-8}
\]

where:

\[R_S = \text{The total thermal resistance of the elements of roof/ceiling construction, in a series along the path of heat transfer, excluding the cavity insulation and the steel framing, } \text{h} \cdot \text{ft}^2 \cdot \text{EF/Brtu [m}^2 \cdot \text{K/W]}\]

\[R_{ins} = \text{The R-value of the cavity insulation, } \text{h} \cdot \text{ft}^2 \cdot \text{EF/Brtu [m}^2 \cdot \text{K/W]}\]

\[F_{cor} = \text{The correction factor listed in Table 502.2.1.2, dimensionless}\]

**Exception:** Overall system tested \(U_R\) values for roof/ceiling assemblies from approved laboratories, when such data are acceptable to the building official.

### Table 502.2.1.2: Correction Factors (\(F_{cor}\)) for Roof/Ceiling Assemblies

<table>
<thead>
<tr>
<th>MEMBER SIZE(^a)</th>
<th>SPACING OF FRAMING MEMBERS (INCHES)</th>
<th>CAVITY INSULATION R-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R-19</td>
</tr>
<tr>
<td>2x4</td>
<td>16 o.c.</td>
<td>0.90</td>
</tr>
<tr>
<td>2x6</td>
<td></td>
<td>0.70</td>
</tr>
<tr>
<td>2x8</td>
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</tr>
<tr>
<td>2x4</td>
<td>24 o.c.</td>
<td>0.95</td>
</tr>
</tbody>
</table>

\(\text{R} \) denotes the R-value of the cavity insulation, \(\text{h}\) denotes the thickness of the material, \(\text{ft}\) denotes the foot, \(\text{EF}\) and \(\text{Brtu}\) are energy factors, and \(\text{K/W}\) denotes the units of thermal resistance.
For SI: 1 inch = 25.4 mm.

a. Linear interpolation for determining Correction Factors which are intermediate between those given in the table is permitted.
b. Applies to steel framing members up to a maximum thickness of 0.064 inches (16 gage).

Committee Reason: Based on proponent’s published reason. The modification clarifies that the truss members are penetrating the insulation cavity.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jonathan Humble, AIA, American Iron and Steel Institute and David D. Lovich, PE Owens Corning, requests Approved as Modified by this comment.

Modify proposal as follows:

502.2.1.2 Roof/ceiling. The combined thermal transmittance value ($U_o$) of the gross area of the roof or ceiling assembly shall not exceed the value given in Table 502.2. Equation 5-5 shall be used to determine acceptable combinations to meet this requirement. Skylight shafts, 12 inches (305 mm) in depth and greater, shall be insulated to no less than R-13 in climates 0-4,000 HDD and R-19 in climates greater than 4,000 HDD. The skylight shaft thermal performance shall not be included in the roof thermal transmission coefficient calculation.

$$U_o = \frac{(U_R x A_R) + (U_S x A_S)}{A_o} \quad \text{(Equation 5-5)}$$

where:

- $U_R$ = The average thermal transmittance of the gross roof/ceiling area, Btu/h ft$^2$ °F [W/(m$^2$K)]
- $A_R$ = The gross area of the roof/ceiling assembly, ft$^2$ [m$^2$]
- $U_S$ = The combined thermal transmittance of the various paths of heat transfer through the opaque roof/ceiling area, Btu/h ft$^2$ °F [W/(m$^2$ K)]
- $A_S$ = Opaque roof/ceiling assembly area, ft$^2$ [m$^2$]
- $U_S$ = The combined thermal transmittance of the area of all skylight elements in the roof/ceiling assembly, Btu/h ft$^2$ °F [W/(m$^2$ K)]
- $A_S$ = The area (including frame) of all skylights in the roof/ceiling assembly, ft$^2$ [m$^2$]

Notes:
When more than one type of roof/ceiling and/or skylight is used, the $U$ and $A$ terms for those items shall be expanded into their subelements as:

$$(U_{R1} x A_{R1}) + (U_{R2} x A_{R2}) + \text{ etc.} \quad \text{(Equation 5-6)}$$

Access doors or hatches in a roof/ceiling assembly shall be included as a subelement of the roof/ceiling assembly.

When the roof/ceiling assembly contains cold-formed steel truss framing, the $U_o$ value to be used in Equation 5-5 shall be determined by Equation 5-7.1, 5-7.2, or 5-7.3. These equations apply to cold-formed steel truss roof framing spaced at 24 inches (609 mm) on-center and where the penetrations of the truss members through the cavity insulation do not exceed three (3) penetrations for each 4 foot (1,220 mm) length of the truss.

For constructions without foam between the drywall and bottom chord of the steel truss use:

$$U_R = \frac{1}{0.864 x R_{ins} + 0.330} \quad \text{(Equation 5-7.1)}$$

where:

- $R_{ins}$ = The R-value of the cavity insulation, h ft$^2$ °F/Btu [m$^2$K/W]

For constructions with R-3 foam between the drywall and bottom chord of the steel truss use:

$$U_R = \frac{1}{0.864 x R_{ins} + 4.994} \quad \text{(Equation 5-7.2)}$$

For constructions with R-5 foam between the drywall and bottom chord of the steel truss use:

$$U_R = \frac{1}{0.864 x R_{ins} + 7.082} \quad \text{(Equation 5-7.3)}$$

Exception: Overall system tested $U_R$ values for roof/ceiling assemblies from approved laboratories, when such data are acceptable to the building official.

When the roof/ceiling assembly contains conventional C-shaped cold-formed joist/rafter steel framing, the $U_o$ value to be used in Equation 5-8 shall be determined as follows:

$$U_R = \frac{1}{R_s + (R_{ins} * F_{cor})} \quad \text{(Equation 5-8)}$$

where:

- $R_s$ = The total thermal resistance of the elements of roof/ceiling construction, in a series along the path of heat transfer, excluding the cavity insulation and the steel framing, h ft$^2$ °F/Btu [m$^2$K/W]
- $R_{ins}$ = The R-value of the cavity insulation, h ft$^2$ °F/Btu [m$^2$K/W]
- $F_{cor}$ = The correction factor listed in Table 502.2.1.2, dimensionless
Exception: Overall system tested $U_b$ values for roof/ceiling assemblies from approved laboratories, when such data are acceptable to the building official.

**TABLE 502.2.1.2**
CORRECTION FACTORS ($F_{cor}$) FOR ROOF/CEILING ASSEMBLIES

<table>
<thead>
<tr>
<th>MEMBER $^a$</th>
<th>SPACING OF FRAMING MEMBERS $^b$ (INCHES)</th>
<th>CAVITY INSULATION R-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R-19</td>
</tr>
<tr>
<td>2 x 4</td>
<td>16 o.c.</td>
<td>0.90</td>
</tr>
<tr>
<td>2 x 6</td>
<td></td>
<td>0.70</td>
</tr>
<tr>
<td>2 x 8</td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>2 x 10</td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>2 x 12</td>
<td></td>
<td>0.35</td>
</tr>
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<td>24 o.c.</td>
<td>0.95</td>
</tr>
<tr>
<td>2 x 6</td>
<td></td>
<td>0.78</td>
</tr>
<tr>
<td>2 x 8</td>
<td></td>
<td>0.44</td>
</tr>
<tr>
<td>2 x 10</td>
<td></td>
<td>0.44</td>
</tr>
<tr>
<td>2 x 12</td>
<td></td>
<td>0.44</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

a: Applies to steel framing members up to a maximum thickness of 0.064 inches (16 gage).
b: Linear interpolation for determining Correction Factors which are intermediate between those given in the table is permitted.

Commenter’s Reason: We propose that Code Change EC19-02 be further modified to reflect a correction to the equations, specifically to the definitions to the equation designators concerning the reference to the metric conversion. These should be deleted from the proposal, as they are not appropriate to the equations that are shown in colonial values.

The affected equations are:
Equation 5-7.1 under the definition of the designation Rins
Equation 5-8 under the definitions of the designations Rs and Rins

Other metric conversions shown in Section 502.2.1.2 can remain as the equations shown are generic such that the information inputted must consistent in that it is either in metric or colonial values.

**EC20-02**

**502.2.1.3**

**Proposed Change as Submitted:**

**Proponents:** Jonathan Humble, AIA, representing the American Iron and Steel Institute

David D. Lovich, PE, representing Owens Corning

**Revise as follows:**

**502.2.1.3 Floors over unheated spaces.** The combined thermal transmittance value ($U_o$) of the gross area of floors over unheated spaces shall not exceed the value given in Table 502.2. For floors over outdoor air, i.e., overhangs, $U_o$ values shall not exceed the value for roofs given in Table 502.2. Equation 5-7 shall be used to determine acceptable combinations to meet this requirement.

\[
U_o = \frac{\left( U_{f1} x A_{f1} \right) + \left( U_{f2} x A_{f2} \right) + \ldots + \left( U_{fn} x A_{fn} \right)}{A_o}
\]

(Equation 5-7)

where:

$U_o$ = The average thermal transmittance of the gross floor area, Btu/h•ft²•°F [W/(m²•°K)]

$A_o$ = The gross area of the different floor assemblies, ft² [m²]

$U_{fn}$ = The combined thermal transmittance of the various paths of heat transfer through the $n^{th}$ floor assembly, Btu/h•ft²•°F [W/(m²•°K)]

$A_{fn}$ = The area associated with the $n^{th}$ floor assembly, ft² [m²]

**Notes:** Access doors or hatches in a floor assembly shall be included as a subelement of the floor assembly.

**Exceptions:** When the floor assembly contains C-shaped cold-formed steel framing, the value of $U_{fn}$ used in Equation 5-7 shall be recalculated using a series path procedure to correct for parallel path thermal bridging. The $U_{fn}$ for purposes of Equation 5-7 for C-shaped cold-formed steel framing construction shall be determined using Equation 5-8 as follows:
\[ U_{fn} = \frac{1}{R_{fn} + (R_{ins} \cdot F_{cor})} \]  

(Equation 5-8)

Where:

- \( R_{fn} \) = The total thermal resistance of the elements of floor construction, in series along the path of heat transfer, excluding the cavity insulation and the steel joist.  
\[ h \text{ft}^2\cdot \text{EF/ Btu} [(m^2\cdot K)/W] \]

- \( R_{ins} \) = The R-value of the cavity insulation.  
\[ h \text{ft}^2\cdot \text{EF/ Btu} [(m^2\cdot K)/W] \]

- \( F_{cor} \) = The correction factor listed in Table 502.1.3, dimensionless

**Exception:** Overall system tested \( U_{fn} \) values for steel framed floors from approved laboratories, when such data are acceptable to the code official.
### TABLE 502.2.1.3
**CORRECTION FACTORS (F<sub>cor</sub>) FOR STEEL FLOOR ASSEMBLIES**

<table>
<thead>
<tr>
<th>MEMBER SIZE&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SPACING OF FRAMING MEMBERS (INCHES)</th>
<th>CAVITY INSULATION R-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R-19</td>
</tr>
<tr>
<td>2x6</td>
<td>16.0.c.</td>
<td>0.70</td>
</tr>
<tr>
<td>2x8</td>
<td></td>
<td>0.35</td>
</tr>
<tr>
<td>2x10</td>
<td></td>
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<td>24.0.c.</td>
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<td>2x8</td>
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<td>2x10</td>
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<td>0.44</td>
</tr>
<tr>
<td>2x12</td>
<td></td>
<td>0.44</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm
NA = Not applicable

**a.** Linear interpolation for determining Correction Factors which are intermediate between those given in the table is permitted.

**b.** Applies to steel framing members up to a maximum thickness of 0.064 inches (16 gage).

**Proponent's Reason:** The IECC does not contain provisions in Chapter 5 for floor envelope assemblies containing C-shaped cold-formed steel framing. This proposal is intended to compliment the requirements of the IECC with provisions that allow a user to analyze floor envelope assemblies containing C-shape cold-formed steel framing.

The values in the table have derived from both steady-state hot box apparatus tests that were conducted by Owens Corning - Science and Technology Center (tests conducted 2000-2001), and through work conducted by ASHRAE Research Project 931 (1999). Each of the hot box apparatus tests consisted of full scale C-shape cold-formed steel framing assemblies that were tested with various levels of insulation located in the cavity portion. By combining our efforts in assessing the results of the tests we have found that the calculations for floors containing conventional wood framing would not be appropriate for determining the overall performance of floor envelopes containing cold-formed steel framing.

Units have been added to the definition of the terms in the equation to be consistent with other equations in the code.

We therefore present the equation and correction factor table to provide a way for users to analyze floor envelope assemblies that contain C-shaped cold-formed steel framing.

**Committee Action:** Approved as Submitted

**Committee Reason:** Based on proponent's published reason.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

---

**Public Comment:**

Jonathan Humble, AIA, American Iron and Steel Institute and David D. Lovich, PE Owens Corning, requests Approved as Modified by this comment.

Modify proposal as follows: 502.2.1.3 Floors over unheated spaces. The combined thermal transmittance value (U<sub>o</sub>) of the gross area of floors over unheated spaces shall not exceed the value given in Table 502.2. For floors over outdoor air, i.e., overhangs, U<sub>o</sub> values shall not exceed the value for roofs given in Table 502.2. Equation 5-7 shall be used to determine acceptable combinations to meet this requirement.

\[
U_o = \left( \frac{U_{f_1}A_{f_1}}{A_o} + \frac{U_{f_2}A_{f_2}}{A_o} + \ldots + \frac{U_{f_n}A_{f_n}}{A_o} \right) (Equation 5-7)
\]

where:

- U<sub>f</sub> = The average thermal transmittance of the gross floor area, Btu/h • ft<sup>2</sup> • °F [W/(m<sup>2</sup> • K)]
- A<sub>f</sub> = The gross area of the different floor assemblies, ft<sup>2</sup> [m<sup>2</sup>]
- U<sub>o</sub> = The combined thermal transmittance of the various paths of heat transfer through the n<sup>th</sup> floor assembly, Btu/h • ft<sup>2</sup> • °F [W/(m<sup>2</sup> • K)]
- A<sub>o</sub> = The area associated with the n<sup>th</sup> floor assembly, ft<sup>2</sup> [m<sup>2</sup>]

**Notes:** Access doors or hatches in a floor assembly shall be included as a subelement of the floor assembly.

**Exceptions:** When the floor assembly contains C-shaped cold-
formed steel framing, the value of $U_{fn}$ used in Equation 5-7 shall be recalculated using a series of path procedure to correct for parallel path thermal bridging. The $U_{fn}$ for purposes of Equation 5-7 for C-shaped cold-formed steel framing construction shall be determined as follows:

$$U_{fn} = \frac{1}{R_{fn} + (R_{ins} \cdot F_{cor})}$$

(Equation 5-8)

where:

$R_{fn} =$ The total thermal resistance of the elements of floor construction, in series along the path of heat transfer, excluding the cavity insulation and the steel joist, $h \cdot ft^2 \cdot ^\circ F / \text{Btu} \left(\frac{m^2 \cdot K}{W}\right)$

$R_{ins} =$ The $R$-value of the cavity insulation, $h \cdot ft^2 \cdot ^\circ F / \text{Btu} \left(\frac{m^2 \cdot K}{W}\right)$

$F_{cor} =$ The correction factor listed in Table 502.2.1.3, dimensionless

Exception: Overall system tested $U_{fn}$ values for steel framed floors from approved laboratories, when such data are acceptable to the code official.

### TABLE 502.2.1.3
**CORRECTION FACTORS ($F_{cor}$) FOR STEEL FLOOR ASSEMBLIES**

<table>
<thead>
<tr>
<th>MEMBER SIZE $^a$</th>
<th>SPACING OF FRAMING MEMBERS $^b$ (INCHES)</th>
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<tr>
<td>2 x 10</td>
<td></td>
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</tr>
<tr>
<td>2 x 12</td>
<td></td>
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</tr>
<tr>
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</tr>
<tr>
<td>2 x 12</td>
<td></td>
<td>0.44</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm

a: Applies to steel framing members up to a maximum thickness of 0.064 inches (16 gage).
b: Linear interpolation for determining Correction Factors which are intermediate between those given in the table is permitted.

Commenter’s Reason: We propose that Code Change EC20-02 be further modified to reflect a correction to the equations, specifically to the definitions to the equation designators concerning the reference to the metric conversion. These should be deleted from the proposal, as they are not appropriate to the equations that are shown in colonial values.

The affected equations are:

* Equation 5-8 under the definitions of the designations “$R_{fn}$” and “$R_{ins}$”

Other metric conversions shown in Section 502.2.1.3 can remain, as the equations shown are generic such that the information inputted must be consistent in that it is either in metric or colonial values.

**EC32-02**

502.2.5 (IRC N1102.4)

**Proposed Change as Submitted:**

**Proponent:** Garrett A. Stone, Brickfield, Burchette, Ritts & Stone, PC, representing Cardinal Glass Industries

**THIS PROPOSAL IS ON THE AGENDA OF THE IECC AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**

**Revise as follows:**

1. *IECC 502.2.5 (Supp) Prescriptive path for additions and window replacements.* As an alternative to demonstrating compliance with Section 402 or 502.2, additions with a conditioned floor area less than 500 square feet (46.5 m$^2$) to existing single-family residential buildings and structures shall meet the prescriptive envelope component criteria in Table 502.2.5 for the designated heating degree days (HDD) applicable to the location. The $U$-factor of each individual fenestration product (windows, doors and skylights) shall be used to
calculate an area-weighted average fenestration product U-factor for the addition, which shall not exceed the applicable listed values in Table 502.2.5. For additions, other than sunroom additions, the total area of fenestration products shall not exceed 40 percent of the gross wall and roof area of the addition. The R-values for opaque thermal envelope components shall be equal to or greater than the applicable listed values in Table 502.2.5. Replacement fenestration products (where the some or all of an existing fenestration unit is replaced with an entire new replacement unit, including the frame, sash and glazed portion, is replaced) shall meet the prescriptive fenestration U-factor criteria in Table 502.2.5 for the designated HDD applicable to the location. Conditioned sunroom additions shall be served by a separate heating or cooling system, or shall be controlled as a separate zone of the existing system. Fenestration products used in additions and as replacement windows in accordance with this section shall also meet the requirements of Section 502.1.5 in locations with HDD less than 3,500.

Exception: Replacement skylights shall have a maximum U-factor of 0.50 when installed in any location above 1,999 HDD.

602.4 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with an entire new replacement fenestration product, including frame, sash, and glazed portion, is being replaced, the replacement fenestration product shall have a U-factor that does not exceed the “Glazing U-factor” requirement in Table 602.1 applicable to the climate zone (HDD) where the building is located. The replacement fenestration product(s) must also satisfy the air leakage requirements and SHGC of Sections 601.3.2.2 and 602.2, respectively.

Exception: Replacement skylights shall have a maximum U-factor of 0.50 when installed in any location above 1,999 HDD.

2. IRC N1102.4 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with an entire new replacement fenestration product, including frame, sash and glazed portion, is being replaced in an existing building, the replacement fenestration product shall have a U-factor that does not exceed the “Maximum fenestration U-factor” in Table 502.2.5 of the 2000 International Energy Conservation Code applicable to the climate zone (HDD) where the building is located. Replacement skylights and roof windows shall be permitted to have a maximum U-factor of 0.50 when installed in any location above 1,999 HDD. The replacement fenestration products must also satisfy the SHGC and air leakage requirements of Sections N1102.2 and N1101.3.2.2, respectively.

Proponent’s Reason: The purpose of this proposal is to clarify the existing language of the code to ensure consistent interpretation regarding the application of code requirements to replacement fenestration products.

It is often common practice when fenestration is replaced to remove only the sash and glazing of an existing window and replace them with an entire new fenestration product. Sometimes during the process, the existing frame is also removed, but many times, the new fenestration product is custom made to fit in the existing space left after the sash and glazed portions are removed (within the existing frame).

As written, the current replacement fenestration provisions in the IECC and IRC could be misinterpreted to apply only when the frame and sash and glazed portion of the existing window are removed and replaced. Clearly, this could cause inequitable treatment of replacement fenestration under the code. The intent of the IECC and IRC replacement fenestration provisions is to require a base level of energy performance for a huge segment of the fenestration market – those installed as replacements. Without this proposed change, the code provisions might be interpreted in a way that could exempt a large share of the market on a “technicality.” While we think the correct interpretation of the existing language is to include all replacement fenestration products, this proposal would help to clarify this requirement.

Regardless whether the frame is removed in addition to the sash or left in place, the true test should be whether an entire new fenestration product is installed, and thus, should be subject to the U-factor and SHGC requirements applicable to replacement fenestration. We have not proposed any new performance requirements for replacement fenestration, nor are we proposing that repairs to fenestration products should suddenly become subject to the IECC and IRC. This code change is designed to clarify the current code requirements for replacement fenestration in order to reflect current practice and implement the replacement fenestration provisions as they were intended when they were added to the IECC and IRC. As a result, we do not believe that this proposal would increase construction cost.

ITEM 1 (IECC)

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

ITEM 2 (IRC)

Committee Action: Disapproved

Committee Reason: The language is not clear. The word “some” means “a part” and would trigger the whole requirement and the proponent stated that was not the intent.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

Public Comment:

Garrett A. Stone, Brickfield, Burchette, Ritts & Stone, PC, representing Cardinal Glass Industries, requests Approved as Submitted for Item 2.

Commenter’s Reason: This code proposal is up for final action
because it was approved as submitted by the IECC Committee, but the identical language was disapproved by the IRC Committee. We have submitted this public comment to clarify some of the issues that were raised during the spring hearings, which may have caused unnecessary confusion resulting in the IRC Committee disapproval. The published reason for disapproval indicated that the IRC Committee expressed concerns that the use of the word "some" in the new language -- "some or all of an existing fenestration unit" -- creates a problem because it would somehow force all glazing repairs to comply with the energy efficiency provisions for replacement fenestration. This is not how the proposal is written, nor is it how the proposal is intended to be applied. The intent of this code change is to clarify two points. First that the provisions apply whether or not the frame is removed and replaced, i.e., "some or all of an existing fenestration unit is replaced." Second, that the code requirements for replacement fenestration are triggered only when an entire new fenestration unit is installed, i.e., frame, sash and glazing. This proposal is designed to ensure that a large share of the replacement fenestration market is not permitted to avoid the energy efficiency provisions of the IECC due to unclear code language.

This proposal is necessary because a significant number of replacement window projects in the U.S. are of the "pocket-type" or "insert" variety, which means that the existing frame or sash is not removed and the new window, including a new frame and sash, is inserted in the opening produced by the old frame. (These products are also described in our original reason statement reprinted above.) Arguably, the existing code language already covers these types of pocket window replacements because they are entirely new fenestration products being added to the building. However, we have proposed this new language to ensure that code officials consistently enforce the replacement fenestration requirements when either the pocket-type of product is used or in the traditional sense where the old sashes and frames are removed entirely and replaced with an entire new unit.

Lastly, approval in the IRC is necessary because the IECC Committee, which is charged with primary jurisdiction over energy efficiency provisions of the codes, after taking all of these issues into consideration, already approved this proposal as submitted. In order to maintain consistency among the codes and to clarify the circumstances in which the code provisions apply, the IRC must contain the same language. The code proposal should be adopted in the IECC and the IRC as it was submitted.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:

<table>
<thead>
<tr>
<th>Item 1 AS</th>
<th>Item 2 AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1 D</td>
<td>Item 2 D</td>
</tr>
</tbody>
</table>

EC36-02 505.1

Proposed Change as Submitted:

Proponent: Raymond J. Andrews, representing the New York State, Division of Code Enforcement and Administration

Revise as follows:

Add new text as follows:

SECTION 605
ELECTRICAL POWER AND LIGHTING

605.1 Electrical energy consumption. In residential buildings having individual dwelling units, provisions shall be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units.

Revise as follows:

SECTION 805
ELECTRICAL POWER AND LIGHTING SYSTEMS

Add new text as follows:

805.6 Electrical energy consumption. In buildings having individual dwelling units, provisions shall be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent's published reason. People are more likely to conserve energy when they are provided with the means to track how much they are using.

Assembly Action: No Motion

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Bruce Hunn, American Society of Heating and Air Conditioning Engineers, Inc., representing ASHRAE; Lawrence G. Spielvogel, PE; and Michael C.A Schwedler, PE, representing Trane, request Approved as Modified by this comment.

Modify proposal as follows:

SECTION 805
ELECTRICAL POWER AND LIGHTING SYSTEMS

805.6 Electrical energy consumption. In buildings having individual dwelling units, provisions shall be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units.
Commenter’s Reason: (Hunn) Chapter 8 of the IECC covers the same building types that ANSI/ASHRAE/IESNA 90.1 does in IECC Chapter 7. A similar provision does not appear in 90.1 for several reasons. This electric metering provision will drive the design and construction of high-rise multi-family buildings to include as much energy consuming equipment as possible on the tenant or unit owner meters. Frequently, this means the least efficient types of heating, cooling, and water heating equipment on the market will be used. This metering provision discourages the use of energy efficient central heating, cooling or hot water systems, even though they may be more life cycle cost effective, or requires less installed capacity due to diversity. It also tends to minimize the potential to use heat recovery systems, electric demand control systems, or energy storage systems, which would otherwise be considered or used to reduce energy consumption, demand, and/or energy cost. Also, by master metering the electricity or fuel used, it is usually possible to buy the energy for these services at much lower cost. The part of Proposal EC36-02 that applies to high-rise apartments should be deleted.

Commenter’s Reason: (Spielvogel) The requirement to meter units in high-rise residential buildings should be deleted. Chapter 8 of the IECC covers the same building types that ANSI/ASHRAE/IESNA 90.1 does in IECC Chapter 7. A similar electric metering provision for high-rise multifamily units intentionally does not appear in 90.1 for several reasons. This provision virtually dictates and implies that the design and construction of high-rise multifamily buildings will include as much energy consuming equipment as possible on the tenant or unit owner meters. Most often, this means the least efficient heating, cooling, and water heating equipment will be used. This tends to eliminate or discourage the use of central heating, cooling, or hot water systems, even though they may be more energy efficient, or more life cycle cost effective, or require less installed capacity due to diversity. It also tends to eliminate or discourage the use of heat recovery systems, electric demand control systems, or energy storage systems, which would otherwise be considered or used to reduce energy consumption, demand, and/or energy cost. By master metering the electricity or fuel used, it is often possible to buy the energy for these services at much lower cost as well. For these reasons, this part of Proposal EC36-02 should be deleted. Electric metering of individual high-rise units can increase energy consumption, energy cost, and eliminates conservation potential. Let the owner choose.

Commenter’s Reason: (Schwedler) The change will lead to the unintended consequence of raising energy use and cost in high-rise multi-family buildings.

- Developers of such buildings, if required to install separate electrical metering, will very likely install separate, inefficient electric heating and air-conditioning systems within each dwelling space. The simple reason is that once electrical metering is available, utility costs can be shifted to the tenant very easily. The developer will install the lowest cost system, which will be very inefficient.
- Conversely, a lack of tenant metering leads developers to install central systems that, by code, MUST be more efficient. Separate systems can easily be 20-30% less efficient than large central systems. In smaller buildings the difference in efficiency is limited, so there is a practical reason for the “inconsistency” noted by the original commenter.
- In addition to raw system efficiency, central systems and master metering allow further energy and cost reductions:
  - Central systems can utilize energy storage and heat recovery, thus further reducing the energy usage in building using central systems.
  - Building metering (rather than tenant metering) gives economies of scale when utility rates are negotiated with electricity and natural gas providers.

For these reasons, the above portions of Proposal EC36-02 should be deleted.

Public Comment 2:

Ronald G. Nickson, representing the National Multi Housing Council, requests Disapproved.

Commenter’s Reason: Separate metering for individual dwelling units in buildings four or more stories in height and high-rise buildings will encourage the use of individual HVAC systems which may be less efficient than central HVAC systems designed to match the building requirements. Selection of type of HVAC systems should be left up to the designer based on local conditions, installation, and operating costs.

EC37-02

602.1.2 (IRC N1102.1.2)

Proposed Change as Submitted:

Proponent: John S. Ritterpusch, representing the National Association of Home Builders

THIS PROPOSAL IS ON THE AGENDA OF THE IECC AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IECC 602.1.2 Ceilings. The required “Ceiling R-value” in Table 602.1 assumes standard truss or rafter construction and shall apply to all roof/ceiling portions of the building thermal envelope, including cathedral ceilings. Where the construction technique allows required R-value of the ceiling insulation to be obtained over the wall top plate, R-30 shall be permitted to be used where R-38 is required and R-38 shall be permitted to be used where R-49 is required.

**Exception:** An R-value of R-30 shall be required for cathedral ceilings when the minimum required R-value in Table 602.1 exceeds R-30.

2. IRC N1102.1.2 Ceilings. The required “Ceiling R-value” in Table N1102.1 assumes standard truss or rafter construction and shall apply to all roof/ceiling portions of the building thermal envelope, including cathedral ceilings. Where the construction technique allows required R-value of the ceiling insulation to be obtained over the wall top plate, R-30 shall be permitted to be used where R-38 is required and R-38 shall be permitted to be used where R-49 is required.

**Exception:** An R-value of R-30 shall be required for cathedral ceilings when the minimum required R-value in Table N1102.1 exceeds R-30.

Proponent’s Reason: The current code eliminates the use of standard sized lumber for rafters in construction of cathedral ceilings in many climates. Traditional framing practices do not allow the depth necessary for the more stringent ceiling insulation R-values. Therefore, an exception is needed to establish R-30 as the maximum requirement.
for insulating rafter bays of cathedral ceilings. This will allow for a high level of energy-efficiency, as well as save valuable timber resources that would otherwise wasted.

ITEM 1 (IECC)
Committee Action: Disapproved
Committee Reason: Citing the limitations of “solid-sawn” lumber in cathedral ceilings as a basis to support the proposed reduction in stringency of the code is not justified. No area limitations are prescribed to limit the energy loss. There are alternative design practices available, such as scissor trusses, that achieve the same effect.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved
Committee Reason: The term “cathedral ceiling” is not defined. This proposal has some merit, but the solution to the problem is design, not the code language.

Assembly Action: No Motion

Individual Consideration Agenda
This item is on the agenda for individual consideration because a public comment was submitted.

Gary W. Walker, PE, Walker Engineering, Inc., representing Manufactured Housing Institute, requests Approved as Submitted for Items 1 and 2.

Commenter’s Reason: The proposal will allow the use of cathedral ceilings in regions where the heating degree-days (HDD) exceed 4,000. The International Residential Code allows a reduction in “Ceiling R-value” where the construction technique allows the required R-value of ceiling insulation to be obtained over a wall top plate (Section N1102.1.2 Ceilings). This proposal will expand the use of cathedral ceilings to regions with greater than 4,000 HDD while still requiring a high R-value for the ceiling.

Analysis: The following combinations of actions would achieve technical consistency between the IECC and the IRC:

- Item 1D Item 2 D
- Item 1 AS item 2 AS

EC52-02
803.2.5.1

Proposed Change as Submitted:


Add new text as follows:

803.2.5.1 Energy recovery ventilation systems.
Individual fan systems that have both a design supply air capacity of 5,000 cfm or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity shall have an energy recovery system that provides a change in the enthalpy of the outdoor air supply of 50 percent or more of the difference between the outdoor air and return air at design conditions. Effectiveness shall be rated in accordance with ARI 1060. Provision shall be made to bypass or control the energy recovery system to permit cooling with outdoor air where cooling with outdoor air is required.

Exceptions: An energy recovery ventilation system shall not be required in any of the following conditions.
1. Where energy recovery systems are prohibited by the International Mechanical Code.
2. Laboratory fume hood systems with a total exhaust rate of 15,000 cfm or less.
3. Laboratory fume hood systems with a total exhaust rate greater than 15,000 cfm that include at least one of the following features:
   3.1 Variable air volume hood exhaust and room supply systems capable of reducing exhaust and makeup air volume to 50 percent or less of design values.
   3.2 Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2 Fahrenheit degrees (1.1 Celsius degrees) below room set point, cooled to no cooler than 3 Fahrenheit degrees (1.7 Celsius degrees) above room set point, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
4. Systems serving spaces that are not cooled and that are heated to no more than 60°F (18.3°C).
5. Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
6. Heating systems in climates with less than 3600 HDD65.
7. Cooling systems in climates with a 2.5% cooling design wet-bulb temperature less than 65°F (18.3EC).
8. Systems requiring dehumidification that employ series-style energy recovery coils wrapped around the cooling coil.
Proponent’s Reason: The purpose of this proposed change is to add a threshold requirement for the mandatory use of energy recovery ventilation (ERV) systems. The reason for the change is to make the IECC consistent with ASHRAE 90.1-99. ERV systems are now required by ASHRAE 90.1 under the same conditions as proposed here.

Requirements for outdoor ventilation air rates in ASHRAE 62, and subsequently the model codes, have increased over recent years. This has placed new demands on HVAC equipment and operating budgets for buildings. The increased energy efficiency has also reduced equipment capacity. These conditions have increased the value of energy recovery in ventilation systems such that mandatory a requirement in specified conditions is now reasonable and justified. ERV reduces the load on the system due to outdoor air by taking advantage of the work that has been done to heat, cool, humidify or dehumidify a space. Instead of losing that energy to the atmosphere when air is exhausted, the energy is recovered and used to pre-treat incoming outdoor air, thus reducing the loads on the HVAC system. ERV systems are particularly effective in this application. In a study for the U.S. Department of Energy by the Pacific Northwest National Laboratory, it was determined that if the most efficient of the various types of ERV systems were widely used, 0.4 Quads of energy could be saved annually. This would result in a 15% reduction of the total energy used in commercial heating, refrigeration, ventilation and air conditioning (R.K. Collier Jr.; Desiccant Dehumidification and Cooling Systems: Assessment and Analysis; September, 1997; PNNL-11694).

There are several different types of ERV systems that are provided by a variety of manufacturers and suppliers. ASHRAE 90.1-99 now mandates their use under its prescriptive compliance path provisions (90.1 Section 6.3.6.1). The parameters and the exceptions all define the boundary conditions within which mandatory requirement for application of ERV technology is justified. The proposed change reflects the same threshold requirement and exceptions as ASHRAE 90.1-99. The 1999 edition of 90.1 is currently referenced in the IECC (2001 Supplement). The proposed requirement is part of 90.1’s prescriptive compliance path. As such it is appropriate and consistent to reflect the same requirement as part of the IECC’s prescriptive compliance path in Chapter 8 for commercial buildings. The provisions are geared in that they treat all ERV systems generically without being specific or limiting as to type. Not all ERV system types are equally efficient, but under the conditions and limitations in 90.1 and this proposal, all system types will accomplish the objective of substantial energy efficiency.

The reference to ARI 1060, Rating Air-to-Air Heat Exchangers for Energy Recovery Ventilation Equipment, for determining effectiveness strengthens these requirements as originally laid out in ASHRAE 90.1. The ARI Rating Standard and its accompanying ARI performance certification program for energy recovery ventilation equipment are not specifically referenced in 90.1 because they were not available for reference when the 90.1 requirements were written. ARI 1060 certification first became available in January of 2001. The certified ratings directory today includes a wide variety of equipment and manufacturers and is available to designers and code officials on the web at www.ari.org/directories/erv/. The ARI certification provides all the necessary information to ensure proper application and sizing of energy recovery systems and their impact on the HVAC system. The standard and certification program create a level playing field for industry and assurance of performance for the users of the code in like manner to current requirements for performance of unitary products in accordance with other ARI standards and certification programs referenced in the IECC. In particular, the standard provides information critical to measuring the enthalpy effectiveness in accordance with the new requirements. Correct enthalpy effectiveness values are essential to proper sizing, meeting the intent of energy conservation and in some cases to proper control of indoor humidity (this is the rationale for the enthalpy definition of effectiveness in 90.1 upon which this proposal is based).

Exceptions: The exceptions are consistent with exceptions (a) through (g) and exception (i) in 6.3.6.1 of ASHRAE 90.1-99. The first proposed exception, referencing the IMC, correlates with a proposed change that will add to the IMC specific installation requirements for ERV systems. Section 504.2 (1) and (2) in the IMC proposal will prohibit the use of ERV systems in hazardous exhaust systems and commercial kitchen hoods, which are the applications that are covered in 90.1 exceptions (c) and (d). The IECC must not require ERV in those exhaust systems in order to avoid a conflict between the IMC and IECC. Proposed exception 1 therefore covers 90.1 exceptions (c) and (d). Proposed exceptions 2 and 3 cover 90.1 exception (a). Not all laboratory fume hoods are hazardous exhaust systems. These exceptions for laboratory fume hoods are therefore appropriate and do not pose any conflict with exception 1 since any laboratory fume hood that is a hazardous exhaust system would be prohibited by exception 1 and the IMC from having an ERV system. Proposed exceptions 4, 5, 6, 7 and 8 cover 90.1 exceptions (b), (e), (f), (g) and (i) respectively.

Exception (h) from 90.1 is not included. Deletion of this exception to the requirement for energy recovery, while a departure from the exact language of ASHRAE 90.1, is an improvement for the purposes of the energy code. This particular exception (energy recovery is not required where the largest exhaust source is less than 75% of the design outdoor airflow) as published in 90.1 constitutes a significant loophole. It effectively says that energy recovery is not required if all exhaust air is removed via numerous smaller capacity systems but energy recovery is required if that same aggregate quantity of air is exhausted via larger capacity exhaust systems. This makes no sense. Instead designs that prior to consideration of energy recovery would fall into this category should be redesigned to collect those exhausts or create new exhausts and capture the energy recovered from those exhausts in order to comply with the intent of the requirement. Legitimate cases such as make-up air for toxic fume hoods, make-up air for large kitchen hoods with grease laden exhaust, etc. where such an exception is truly justified are better handled by the first exception and its reference to applications prohibited in the IMC proposed change.

Definition: The term “energy recovery ventilation system” will be used in the code and the proposed definition will provide clarity for the code user as to its meaning. The definition is based on and consistent with the definition in ARI 1060, which is the standard under which ERV systems are rated and certified for performance. This also identical to the definition proposed for the IMC.

This proposal will not increase the cost of construction.

Bibliography:
ASHRAE 90.1-99
ARI 1060
R.K. Collier Jr.; Desiccant Dehumidification and Cooling Systems: Assessment and Analysis; September, 1997; PNNL-11694

Analysis: While proposed to the Simple HVAC Systems and Equipment provisions (803.2), - the new language appears to be inclusive of requirements specific to Complex HVAC Systems and Equipment (803.3). An independent, yet related change (EC56-02) proposes new provisions for exhaust air energy recovery for both Simple (803.2) and Complex (803.3) HVAC Systems and Equipment.

Committee Action: Disapproved

Committee Reason: Energy recovery systems are too complex to be included in the simplified HVAC systems section.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Ken Schoonover, KMS Associates, Inc., representing Airxchange, Inc., requests Approved as Modified by this comment.

Modify proposal as follows:
Energy recovery ventilation systems. Individual
fan systems that have both a design supply air capacity of 5,000 cfm
or greater and a minimum outside air supply of 70 percent or greater of
the design supply air quantity shall have an energy recovery system
that provides a change in the enthalpy of the outdoor air supply of 50
percent or more of the difference between the outdoor air and return air
at design conditions. Effectiveness shall be rated in accordance with
ARI 1060. Provision shall be made to bypass or control the energy
recovery system to permit cooling with outdoor air where cooling with
outdoor air is required.

Exceptions: An energy recovery ventilation system shall not be
required in any of the following conditions.
1. Where energy recovery systems are prohibited by the
   International Mechanical Code.
2. Laboratory fume hood systems with a total exhaust rate of
   15,000 cfm or less.
3. Laboratory fume hood systems with a total exhaust rate greater
   than 15,000 cfm that include at least one of the following features:
   3.1 Variable air volume hood exhaust and room supply
       systems capable of reducing exhaust and makeup air
       volume to 50 percent or less of design values.
   3.2 Direct makeup (auxiliary) air supply equal to at least 75
       percent of the exhaust rate, heated no warmer than 2
       Fahrenheit degrees (1.1 Celsius degrees) below room set
       point, cooled to no cooler than 3 Fahrenheit degrees (1.7
       Celsius degrees) above room set point, no humidification
       added, and no simultaneous heating and cooling used for
       dehumidification control.
4. Systems serving spaces that are not cooled and that are
   heated to no more than 60°F (18.3°C).
5. Where more than 60 percent of the outdoor heating energy is
   provided from site-recovered or site solar energy.
6. Heating systems in climates with less than 3600 HDD65.
7. Cooling systems in climates with a 2.5 %
   wet-bulb temperature less than 65°F (18.3°C).
8. Systems requiring dehumidification that employ series-style
   energy recovery coils wrapped around the cooling coil.

Commenter’s Reason: The committee’s reason for disapproval, and
the biggest objection to the original proposed change, is that it was
proposed for the simple system subsection of Chapter 8. The first
modification will place the proposed text in the complex system
subsection and thus not be applicable to simple systems. The text
resulting from all of these modifications will bring consistency between
the IECC and ASHRAE 90.1. The ASHRAE standard requires ERV
systems, mandates their use, as proposed here based on the
significant energy conservation benefits that will be achieved. Concern
was expressed that Chapter 8 loses its identity if it ends up covering all
the same requirements as ASHRAE 90.1. Energy recovery ventilation
as mandated by 90.1 is too substantial an issue to exclude. If the code
effectively leaves out substantive pieces in a complex system for the
sake of a simplified compliance approach, then the code is not
adequately accomplishing its primary energy conservation objective.

The second modification deletes the requirement for determining
effectiveness by ARI 1060. Not all of the various types of ERV systems
are appropriately rated for effectiveness by ARI 1060. Further work is
needed on that issue and therefore the code at this time should not limit
effectiveness ratings to the ARI Standard.

The third modification is essentially editorial. ASHRAE no longer
publishes 2.5 percent temperature data. For applicability of the
exception, the threshold of a one percent temperature less than 64
degrees F equates to the former 2.5 percent temperature less than 65
degrees F. This was introduced at the public hearing and the committee
did not express any concerns with these amendments.

Editorial correction: In exception 4, the metric equivalent for 60 degrees
F should be 15.5 degrees C.
## TABLE 805.5.2
### INTERIOR LIGHTING POWER

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<th>BUILDING OR AREA TYPE</th>
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<td>Automotive Facility</td>
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<tr>
<td>Convention, conference or meeting center²</td>
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<td>1.5</td>
</tr>
<tr>
<td>Court House/Town Hall</td>
<td>1.4</td>
<td>NA</td>
</tr>
<tr>
<td>Dormitory</td>
<td>1.5</td>
<td>NA</td>
</tr>
<tr>
<td>Hotel function²</td>
<td>NA 1.7</td>
<td>2.4</td>
</tr>
<tr>
<td>Motel</td>
<td>2.0</td>
<td>NA</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>1.0</td>
<td>NA</td>
</tr>
<tr>
<td>Parking Garage</td>
<td>0.3</td>
<td>NA</td>
</tr>
<tr>
<td>Penitentiary</td>
<td>1.2</td>
<td>NA</td>
</tr>
<tr>
<td>Police/Fire Station</td>
<td>1.3</td>
<td>NA</td>
</tr>
<tr>
<td>Post Office</td>
<td>1.6</td>
<td>NA</td>
</tr>
<tr>
<td>Transportation</td>
<td>1.2</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Proponent’s Reason:** This proposal increases the simplicity of the application of Chapter 8 of the code and allows for the use of the simpler chapter 8 for many more entire building types.

The application of a single method of compliance (‘Entire Building’ method) makes compliance easier for the user. The addition of these 12 building types allows more users to apply this easier method without resorting to the more time consuming “Tenant…” method. These additional building types also allow more users to apply chapter 8 to their building rather than considering the use of chapter 7.

These additional values were developed using the same methodology and assumptions used to develop the current building and tenant values in the table. This inclusion of additional building types therefore maintains the consistency of the basis for the values in the table and increases its effectiveness.

Further, it is the intention that when a revised set of values based on recently published light level guidelines from the IESNA is available they will be proposed as direct replacements. This will bring the IECC code to the latest and most energy efficient set of values available.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Ronald Majette, representing United States Department of Energy, requests Approved as Modified by this comment.

**Committee Action:** Approved as Submitted

**Committee Reason:** Based on proponent’s published reason.
Modify proposal as follows:

**TABLE 805.4.2**

<table>
<thead>
<tr>
<th>BUILDING OR AREA TYPE</th>
<th>ENTIRE BUILDING (W/ft²)</th>
<th>TENANT AREA OR PORTION OF BUILDING (W/ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditorium</td>
<td>NA</td>
<td>1.8 ± 6</td>
</tr>
<tr>
<td>Automotive Facility</td>
<td>0.9 ± 5</td>
<td>NA</td>
</tr>
<tr>
<td>Bank/Financial institution a</td>
<td>NA</td>
<td>1.5 ± 2</td>
</tr>
<tr>
<td>Classroom/lecture hall b</td>
<td>NA</td>
<td>1.4 ± 6</td>
</tr>
<tr>
<td>Convention, conference or meeting center a</td>
<td>1.2 ± 4</td>
<td>1.3 ± 6</td>
</tr>
<tr>
<td>Corridor, restroom, support area</td>
<td>NA</td>
<td>0.9 ± 6</td>
</tr>
<tr>
<td>Court House/Town Hall</td>
<td>1.2 ± 4</td>
<td>NA</td>
</tr>
<tr>
<td>Dining a</td>
<td>NA</td>
<td>0.9 ± 4</td>
</tr>
<tr>
<td>Dormitory</td>
<td>1.0 ± 5</td>
<td>NA</td>
</tr>
<tr>
<td>Exercise center a</td>
<td>1.0 ± 4</td>
<td>0.9 ± 4</td>
</tr>
<tr>
<td>Exhibition hall</td>
<td>NA</td>
<td>1.3 ± 6</td>
</tr>
<tr>
<td>Grocery store c</td>
<td>1.5 ± 9</td>
<td>1.6 ± 9</td>
</tr>
<tr>
<td>Gymnasium playing surface</td>
<td>NA</td>
<td>1.4 ± 9</td>
</tr>
<tr>
<td>Hotel function a</td>
<td>1.0 ± 7</td>
<td>1.3 ± 4</td>
</tr>
<tr>
<td>Industrial work, &lt; 20 ft ceiling height</td>
<td>NA</td>
<td>1.2 ± 4</td>
</tr>
<tr>
<td>Industrial work, 20 ft ceiling height</td>
<td>NA</td>
<td>1.7 ± 4</td>
</tr>
<tr>
<td>Kitchen</td>
<td>NA</td>
<td>1.2 ± 2</td>
</tr>
<tr>
<td>Library a</td>
<td>1.3 ± 6</td>
<td>1.7 ± 4</td>
</tr>
<tr>
<td>Lobby—hotel a</td>
<td>NA</td>
<td>1.1 ± 9</td>
</tr>
<tr>
<td>Lobby—other a</td>
<td>NA</td>
<td>1.3 ± 6</td>
</tr>
<tr>
<td>Mall, arcade, or atrium</td>
<td>NA</td>
<td>0.6 ± 4</td>
</tr>
<tr>
<td>Medical and clinical care b, d</td>
<td>1.2 ± 6</td>
<td>1.2 ± 6</td>
</tr>
<tr>
<td>Motel</td>
<td>1.0 ± 6</td>
<td>NA</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>0.7 ± 6</td>
<td>NA</td>
</tr>
<tr>
<td>Museum</td>
<td>1.1 ± 6</td>
<td>1.0 ± 6</td>
</tr>
<tr>
<td>Office a</td>
<td>1.0 ± 3</td>
<td>1.1 ± 6</td>
</tr>
<tr>
<td>Parking Garage</td>
<td>0.3</td>
<td>NA</td>
</tr>
<tr>
<td>Penitentiary</td>
<td>1.0 ± 2</td>
<td>NA</td>
</tr>
<tr>
<td>Police/Fire Station</td>
<td>1.0 ± 3</td>
<td>NA</td>
</tr>
<tr>
<td>Post Office</td>
<td>1.1 ± 6</td>
<td>NA</td>
</tr>
<tr>
<td>Religious worship a</td>
<td>1.3 ± 2</td>
<td>2.4 ± 2</td>
</tr>
<tr>
<td>Restaurant a</td>
<td>1.6 ± 7</td>
<td>0.9 ± 2</td>
</tr>
<tr>
<td>Retail sales, wholesale showroom c</td>
<td>1.5 ± 9</td>
<td>1.7 ± 4</td>
</tr>
<tr>
<td>School</td>
<td>1.2 ± 5</td>
<td>NA</td>
</tr>
<tr>
<td>Storage, industrial and commercial</td>
<td>0.8 ± 6</td>
<td>0.8 ± 6</td>
</tr>
<tr>
<td>Theaters—motion picture</td>
<td>1.2 ± 4</td>
<td>1.0 ± 4</td>
</tr>
<tr>
<td>Theaters—performance a</td>
<td>1.6 ± 4</td>
<td>2.6 ± 4</td>
</tr>
<tr>
<td>Transportation</td>
<td>1.0 ± 2</td>
<td>NA</td>
</tr>
<tr>
<td>Other</td>
<td>0.6</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Commenter’s Reason:** This proposed revision to the current Table 805.4.2 is the update that was promised as part of EC74-02. EC74-02 was approved at the previous code hearings. This revision completes the previous code change already approved. The values in this table have been approved by the IESNA technical review committees. These values represent the most up to date energy efficient lighting design criteria that meets lighting needs and provides cost effective energy efficiency for commonly designed space types as well as whole buildings.

The new values have been developed using the same method as the current values in Table 805.4.2 and are the product of a comprehensive update of the inputs to these models. This update incorporates measured data on fluorescent fixture light loss factors and space type characteristics of new commercial construction, as well as the latest lighting level recommendations as published in the IESNA Lighting Handbook 9th edition. A few values are increased due to the application of commonly used design strategies. However, most values show decreases due to increased technology efficiencies, the application of the new IES lighting level recommendations, and measured data on light loss factors. The adoption of these new values will make the lighting power requirements in the IECC code the most current and defensible available.

Additional technical details on the specific review performed as part of this update are as follows:

**Light level inputs.** Each of the 124 individual space models was reviewed and both task lighting and general lighting levels compared with the new IESNA 9th Edition recommendations and changes were made where appropriate.

**Applied lighting technologies.** Each of the 124 individual space models incorporates up to three specific lighting technologies represented by generic luminaire (fixture) types. Changes were made to more appropriate technologies where current design practice warranted.

**Lighting technology application formula.** The formula was revised to directly weight the technologies by lumen output of each technology providing a more accurate assessment of power needs for all technology types.

**Lighting technology efficiencies and light loss factors.** The lamp efficacy for each of the 35 generic luminaire/fixture types and the
associated Lamp Lumen Depreciation factors were reviewed against current, commonly available technologies. A recent study (Luminaire Dirt Depreciation Study, July 2000, NALMCO No. CX824574-01-0) was used to update these values for most fluorescent luminaire types. The luminaire dirt depreciation value for all remaining types was reviewed against the latest IESNA Lighting Handbook.

**Luminaire/Fixture data.** The generic luminaire type performance characteristics (efficiency, etc.) are based on the actual tested characteristics of over 240 specific luminaire products. These were reviewed and found to be generally still valid. New luminaire data was incorporated where applicable.

**Whole building LPD development data.** The proposed whole building values are derived by applying the 124 space models to detailed interior space type data on a set of 246 buildings (increased from 95).
INTERNATIONAL RESIDENTIAL CODE - BUILDING

RB1-02
R101.2, R102.7, R102.7.1, R110.2, R202, R317.1.1, R502.11.3, R802.10.4, R907.2, Appendix J

Proposed Change as Submitted:

Proponent: John Terry, representing the International Existing Building Code Drafting Committee

Revise as follows:

R101.2 Scope. The provisions of the International Residential Code for One– and Two–Family Dwellings shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one– and two–family dwellings and multiple single–family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures.

Alterations, repairs, additions and movement of detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures shall also comply with the International Existing Building Code.

R102.7 Existing structures. The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the International Property Maintenance Code, the International Existing Building Code or the International Fire Code, or as is deemed necessary by the building official for the general safety and welfare of the occupants and the public.

R102.7.1 Additions, alterations or repairs. Additions, alterations or repairs to any structure shall conform to that required for a new structure without requiring the existing structure to comply with all of the requirements of this code, unless otherwise stated. Additions, alterations or repairs shall not cause an existing structure to become unsafe or adversely affect the performance of the building.

Additions, alterations, renovations and repairs to any structure shall comply with the provisions of the International Existing Building Code and this code, as applicable.

R110.2 Change in use. Changes in the character or use of an existing structure shall not be made except as specified in Sections 3405 and 3406 of the International Existing Building Code.

SECTION 202
DEFINITIONS

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

R317.1.1 Alterations, repairs and additions. When interior alterations, repairs or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be provided with smoke alarms located as required for new dwellings; the smoke alarms shall be interconnected and hard wired.

Exceptions:

1. Smoke alarms in existing areas shall not be required to be interconnected and hard wired where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure; unless there is an attic, crawl space, or basement available which could provide access for hard wiring and interconnection without the removal of interior finishes.

2. Repairs to the exterior surfaces of dwellings are exempt from the requirements of this section.

Alterations, repairs or additions to existing dwellings shall comply with the applicable smoke alarm requirements as a Group R-3 occupancy in the International Existing Building Code.

R502.11.3 Alterations to trusses. Truss members and components shall not be cut, notched, spliced or otherwise altered in any way without the approval of a registered design professional. Alterations resulting in the addition of load (e.g. HVAC equipment, water heater, etc.), that exceed the design load for the truss, shall not be permitted without verification that the truss is capable of supporting the additional loading, comply with the applicable structural requirements identified in the International Existing Building Code.

R802.10.4 Alterations to trusses. Truss members shall not be cut, notched, drilled, spliced or otherwise altered in any way without the approval of a registered design professional. Alterations resulting in the addition of load (e.g., HVAC equipment, water heater) that exceed the design load for the truss shall not be permitted without verification that the truss is capable of supporting such additional loading; comply with the applicable structural requirements identified in the International Existing Building Code.
R907.1 General. Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of this chapter. Roof repairs to existing roofs and roof coverings shall comply with the provisions of Chapter 34 of the International Existing Building Code, but more than 25 percent of the roof covering of any building shall not be removed and replaced within a 12-month period unless the entire roof covering is made to conform to the requirements for new roofing.

Exception: Reroofing shall not be required to meet the minimum design slope requirement of one-fourth vertical in 12 units horizontal (2-percent slope) in Section R905 for roofs that provide positive roof drainage.

R907.2 Structural and construction loads. The Existing structural roof components shall be capable of supporting the roof covering system and the material and equipment loads that will be encountered during installation of the roof covering system shall comply with Section 507 of the International Existing Building Code.

Delete without substitution:

APPENDIX J
EXISTING BUILDINGS AND STRUCTURES

Delete Appendix J in its entirety.

Proponent’s Reason: 1. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.


The proposed code change submitted here is a part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

2. Appendix J proposed change: Appendix J is proposed to be deleted in its entirety as the IEBC addresses existing buildings and structures.

Committee Action: Disapproved

Committee Reason: This change would require compliance with three different documents in certain circumstances. The reference is to an incomplete document and there will be some overlap between adoption of this change and the time the reference document is completed. The term “as applicable” is ambiguous.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Terry, State of New Jersey, representing the IEBC Drafting Committee, requests Approved as Modified by this comment.

Modify proposal as follows:

R101.2 Scope. The provisions of the International Residential Code for One- and Two-Family Dwellings shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures.

Alterations, repairs, additions and movement of detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures shall also comply with the International Existing Building Code.

R102.7 Existing structures. The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the International Property Maintenance Code, the International Existing Building Code or the International Fire Code, or as is deemed necessary by the building official for the general safety and welfare of the occupants and the public.

R102.7.1 Additions, alterations, or repairs or moved buildings. Additions, alterations, renovations and repairs to any structure and moved buildings shall comply with the provisions of the International Existing Building Code and this code, as applicable.

R110.2 Change in use. Changes in the character or use of an existing structure shall not be made except as specified in the International Existing Building Code.

Section 202
DEFINITIONS

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

R317.1.1 Alterations, repairs and additions. Alterations, repairs or additions to existing dwellings shall comply with the applicable smoke alarm requirements as a Group R-3 occupancy in the International Existing Building Code.

R502.11.3 Alterations to trusses. Truss members and components shall not be cut, notched, spliced or otherwise altered in any way without the approval of a registered design professional. Alterations resulting in the addition of load (e.g., HVAC equipment, water heater, etc.), shall comply with the applicable structural requirements identified in the International Existing Building Code.

R802.10.4 Alterations to trusses. Truss members shall not be cut, notched, drilled, spliced or otherwise altered in any way without the approval of a registered design professional. Alterations resulting in the addition of load (e.g., HVAC equipment, water heater) shall comply with the applicable structural requirements identified in the International Existing Building Code.

R907.1 (Supp) General. Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 34 this chapter. Roof repairs to existing roofs and roof coverings shall comply with the provisions of the International Existing Building Code, but more than 25 percent of the roof covering of any building shall not be removed and replaced within a 12-month period unless the entire roof covering is made to conform to the
requirements for new roofing:

Exception: Reroofing shall not be required to meet the minimum design slope requirement of one–fourth vertical in 12 units horizontal (2–percent slope) in Section R905 for roofs that provide positive roof drainage.

APPENDIX J
EXISTING BUILDINGS AND STRUCTURES

Delete Appendix J in its entirety.

Commenter’s Reason: This code change was originally Disapproved. The proposed modification simply deletes the part of text in Section R101.2 which currently appears in section R102.7.1 addressing additions, alterations and repairs and its duplication in Section R101.2 is unnecessary. Moved buildings are added to Section R102.7.1 as it is better located with alterations, additions and repairs.

Section R907.1 is revised to reflect what is found in the 2002 Supplement without any changes.

The IRC-Building/Energy development committee disapproved the code change because: "This change would require compliance with three different documents in certain circumstances. The reference is to an incomplete document and there will be some overlap between adoption of this change and the time the reference document is completed. The term “as applicable” is ambiguous.”

Contrary to the reported reason for Disapproval, the IEBC is, in fact, complete and is undergoing maintenance of provisions in the 2002 Cycle, just like all the I-codes. In recognition of this fact, the IBC General Committee approved code change proposal G133, that replaces the current text of 2000 IBC chapter 34, Existing Structures, with a reference to the IEBC. The IEBC Drafting process was very similar to the process used to develop the IBC - a committee developed a draft(s) which was then exposed to the rigors of the ICC Code Development Process. The 2003 IEBC will be part of the 2003 family of International Codes. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings. The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001.

As to compliance with three different codes in some circumstances, this is no different from what is already in the IRC. The following are some examples of current references to other codes and standards in the IRC:

- Reference to IBC : Sections R110.2, R202 (Masonry Unit), R301.2.1.2
- Reference to IFC : Sections R102.7, G2402.3, G2411.2
- Reference to IPC : Sections R903.4.1, G2402.3
- Reference to IMC : Sections M1301.1, G1202.3
- Reference to IPMC : R102.7
- Reference to IECC : N1101.2.1, N1101.2.2, N1101.3.2.1, N1101.3.2.2
- Reference to NFPA : R317 (NFPA 72), M1801.3.1 (NFPA 31), G2411.2 (NFPA 58)

Regarding the term “as applicable”, this term is already used in the I-Codes. The following are some examples of sections in the I-Codes where this term is currently used:

- IRC : Sections 604.2.14.1.3, 911.1, 912.4
- IFCC : Sections 607.5.4.1, 1004.1
- IFC : Sections R326.1, R502.2.1, R502.11.4, M2001.1.1, G2450.1

The IEBC Drafting Committee respectfully requests the membership approval of this public comment (AMPC)

Proposed Change as Submitted:

Proponent: Rick Davidson, representing Minnesota Building Officials

Revise as follows:

R101.2 Scope. The provisions of the International Residential Code for One– and Two–Family Dwellings shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one– and two–family dwellings and multiple single–family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures.

Proponent’s Reason: This is primarily an editorial change. The term “detached” is unnecessary and confusing. Zoning ordinances regulate setbacks, not the IRC. Some communities either do not have zoning regulations or have districts that permit residential structures to be constructed to one or more property lines or permit buildings to be built to property lines by various zoning tools and may or may not be “detached.” The IRC has provisions that react to any combination of setbacks including no setback at all. Furthermore, the term “detached” implies that there is a term “attached” single-family dwellings, which there is not.

Committee Action: Disapproved

Committee Reason: The word detached needs to remain because Seismic Design Category C differentiates between attached and detached for all the seismic provisions for townhouses. Detached is the companion term with multiple and it should not be removed.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Davidson, City of Hopkins, MN, representing the Minnesota Building Officials, requests Approved as Modified by this comment.

Modify proposal as follows:

R301.2.2 Seismic provisions. The seismic provisions of this code shall apply to buildings constructed in Seismic Design Categories C, D1, and D2 as determined in accordance with this section.

Exception: Detached one- and two-family dwellings located in Seismic Design Category C are exempt from the seismic requirements of this code.

Commenter’s Reason: The stated reasons for denial of this proposal by the IRC Committee are that (a) there are seismic rules that reference detached structures so the term could not be deleted and (b) “detached” and “multiple” are companion terms. The additional
proposed revision to section 301.2.2 brings both sections into uniformity by deleting the unnecessary term “detached” from both sections which should address the seismic concerns. The IRC only regulates one-family dwellings, two-family dwellings, and townhomes so deleting the term detached should have no impact on those regulations.

In regards to detached and multiple being companion terms, they are not in any sense of the English language companion terms. This argument makes no sense. And, there really is no such thing as “detached one-family and detached two-family dwellings” in the IRC. There are just one- and two-family dwellings. The term “detached” is unnecessary when describing one-family dwellings. If this term is intended to create a rule requiring distance between dwellings on adjacent lots, it doesn’t accomplish the objective. The IRC allows dwellings to be built adjacent to property lines by section 302. Any open space requirements are left to local zoning regulations. If local zoning ordinances permit by rule, or lack of rule, the construction of a dwelling next to a property line, does that make the dwelling something other than a “detached” dwelling? No, it does not. What if nothing is ever built to the property line on the adjacent lot, what is the dwelling “detached” from? Furthermore, the term “detached” also appears to modify “two-family dwellings”. Exactly what a “detached two-family dwelling” is unclear.

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**RB3-02**

**R105.2 (IBC 105.2)**

Proposed Change as Submitted:

Proponent: Edmund C. Domian, CBO, West Valley City, Utah

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IRC 105.2 (Supp) Work exempt from permit.
   Permits shall not be required for the following. Exemption from the permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction.

   Building:
   (No change to items 1 through 8)

   9. Window awnings supported by an exterior wall which do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.

   10. Platforms and decks less than 500 square feet (46 451m²) in projected area which are less than 30 inches (762 mm) above adjacent grade, do not have roof structures above, and are located at least 3 feet (914 mm) from adjacent property lines.

2. IBC 105.2 Work exempt from permit. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:

   Building:
   (No change to items 1 through 11)

12. Window awnings supported by an exterior wall which do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support of Group R-3, as applicable in Section 101.2, and Group U occupancies.

13. Movable cases, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

14. Platforms and decks less than 500 square feet (46 451m²) in projected area which are less than 30 inches (762 mm) above adjacent grade, do not have roof structures above, and are located at least 3 feet (914 mm) from adjacent property lines.

(No change to remainder of Section)

Proponent’s Reason: For the new proposed Exception 9 (IBC Exception 12) there is some point where a window awning becomes a structural hazard if not regulated. As written the current text would allow owner/builders to hang carports off exterior wall without permits, and possibly without necessary beams and columns for support, thereby creating hazards due to snowloads and even dead loads to the unsuspecting public as well as the attached dwelling.

For Exception 10 (IBC Exception 14) there is no hazard to the public for decks that do not provide a falling hazard, have no roof structure above to fall, and do not create a fire hazard for adjacent properties. A similar exception has been in the UBC forever.

ITEM 1 (IRC)
Committee Action: Approved as Modified

Modify proposal as follows:

IRC 105.2 (Supp) Work exempt from permit. Permits shall not be required for the following. Exemption from the permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction.

Building:
(No change to items 1 through 8)

9. Window awnings supported by an exterior wall which do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.

10. Platforms and decks less than 500 square feet (46 451m²) in projected area which are less than 30 inches (762 mm) above adjacent grade, do not have roof structures above, and are located at least 3 feet (914 mm) from adjacent property lines.
Committee Reason: The proponent's published reason for Exception 9. The modification was made to delete Exception 10 because a 500 square feet deck is too large to exempt from regulation.

Assembly Action: No Motion

ITEM 2 (IBC)
Committee Action: Disapproved

Committee Reason: A similar code change (G32-99) was previously considered and disapproved. The added text would not improve the code. There is no substantiation for either the 54 inch dimension in Item #12 or the 500 square foot area in Item #14.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

Public Comment 1:

Edmund C. Domian, West Valley City, UT, requests Approved as Modified by this comment.

Modify proposal as follows:

Add the following exception #10 to IRC section R105.2

10. Platforms and decks less than 200 square feet in floor area which are less than 30” above adjacent grade and are located at least 3 feet from property lines.

Commenter’s Reason: There is no hazard to the public for decks that do not create a falling hazard and are not close enough to property lines to warrant fire protection. The maximum floor area coincides with the exception for detached storage building. Such structures are very difficult to police and yield almost no revenue for the services required.

Public Comment 2:

Gary W. Walker, P.E., Walker Engineering, Inc., representing Manufactured Housing Institute, requests Approved as Submitted of Items 1 and 2.

Commenter’s Reason: Proposed exception #10 is in the Uniform Building Code under Section 106.3.7. This proposed exception #10 is more restrictive than the UBC exception because (1) it restricts the platform or deck area to less than 500 square feet, (2) it restricts the platforms or decks from having a roof structure above, and (3) it restricts the platforms or decks from being within 3 feet of the property lines. The committee’s reason for recommending disapproval for exception #10 is not justified since the UBC does not restrict the area of the platforms or decks and the UBC does not appear to have had problems with the exception.

Suggested Scoping Modification of Item 2 for coordination with committee modification of Item 1. See page vi for procedural details.

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

Building:

(No change to items 1 through 11)

12. Window awnings supported by an exterior wall which do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support of Group R-3, as applicable in Section 101.2, and Group U occupancies.

13. Movable cases, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

44. Platforms and decks less than 500 square feet (46.451m²), in projected area which are less than 30 inches (762 mm) above adjacent grade, do not have roof structures above, and are located at least 3 feet (914 mm) from adjacent property lines.

(No change to remainder of section)

Analysis: The following combinations of actions would achieve technical consistency between the IBC and the IRC:

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RB14-02
R202

Proposed Change as Submitted:

Proponent: Rick Davidson, City of Hopkins, MN, representing Minnesota Building Officials

Revise as follows:

SECTION 202
DEFINITIONS

ACCESSORY STRUCTURE. In one- and two-family dwellings not more than three stories high with separate
means of egress, a building, the use of which is customarily accessory to and incidental to that of the main building(s) and which is located on the same lot. Examples include, but are not limited to, private garages and carports used for the storage of private motor vehicles, storage and tool sheds, and pool enclosures and equipment buildings.

Proponent’s Reason: In Portland, the IRC Committee indicated some uncertainty regarding the exact meaning of the term “accessory structure”. The added language is proposed to help clarify that the intent is to include only customary and incidental accessory uses and not offices, repair garages, and manufacturing.

Committee Action: Disapproved
Committee Reason: The language is commentary language, not code language, and does not belong in the code.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Davidson, City of Hopkins, representing the Minnesota Building Officials, requests Approved as Submitted.

Commenter’s Reason: At the hearings in Portland in April 2001, the IRC Committee expressed uncertainty about the term “Accessory structure”. At one point it was suggested that an accessory structure could be an office building based on the definition. That uncertainty prompted this proposal. This proposal clarifies that an accessory structure must (a) be a subordinate or secondary building, (b) be a customary and incidental use, and (c) be related to the dwelling(s) (which is the only primary use regulated by the IRC). The examples give the reader direction for interpretation of the section by including uses that are customarily accessory to residential structures. This definition is largely taken from the International Zoning Code. It is not commentary language as was suggested by the IRC Committee Reason. It is similar to the same type of language found in the definitions throughout section 202. And, definitions in use throughout the I-Codes include examples to clarify the intent. The current definition contains clumsy wording, contains references to “main building” which is appropriate for the IBC but not the IRC, and is not clear that the use of the accessory structure must be customarily accessory to the use of the dwelling. That lack of clarity opens the door to inconsistent interpretation and confusion.

Proposed Change as Submitted:

Proponent: Rick Davidson, City of Hopkins, MN, representing the Minnesota Building Officials

1. IRC 202 BASEMENT. That portion of a building that is partly or completely below grade and having a ceiling height of 7 feet 6 inches (2286 mm) or more (see “Story above grade”).

2. IBC 202 BASEMENT. That portion of a building that is partly or completely below grade and having a ceiling height of 7 feet 6 inches (2286 mm) or more (see “Story above grade plane” and Sections 502.1 and 1612.2).

Proponent’s Reason: Currently there are no definitions to distinguish between spaces below grade that will potentially be used for habitable space in the future and those spaces that are not designed or intended for habitable space such as crawl spaces. It provides direction to the building official that this underfloor space may be used for habitable space in the future.

ITEM 1 (IRC)
Committee Action: Disapproved
Committee Reason: This change would create too many conflicts with other portions of the code.

Assembly Action: No Motion

ITEM 2 (IBC)
Committee Action: Disapproved
Committee Reason: This proposed code change, if approved, would inappropriately add technical requirements to a definition and could create conflict with the provisions of Chapter 12. Also, it would make any basement with less than a 7 foot 6 inch height a crawl space.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Davidson, City of Hopkins, representing the Minnesota Building Officials, requests Approved as Modified by this comment.

Modify proposal as follows:

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.
1. IRC 202 Basement. That portion of a building that is partly or completely below grade and having a ceiling height of \( \geq 6 \) feet 6 inches (2286 mm) \( (2032 \text{ mm}) \) or more (see “Story above grade”).

2. IRC 202 Basement. That portion of a building that is partly or completely below grade and having a ceiling height of \( \geq 6 \) feet 6 inches (2286 mm) \( (2032 \text{ mm}) \) or more (see “Story above grade”).

Commenter’s Reason: The IRC currently contains a definition for basement that is stated as being “that portion of a building that is partly or completely below grade”. Interpreted literally, the shallow under floor spaces commonly thought of as crawl spaces are by definition basements. The term crawl space is not defined in the IRC however the term is used. How then does one uniformly apply rules that apply to basements but not crawl spaces? For example, IRC section 305.1 requires basements to have a minimum ceiling height of 6 feet 8 inches. Does that mean crawl spaces must be at least 6 feet 8 inches in height since any under floor space is a basement by definition? Section 317.1 requires smoke detectors in basements and cellars but not in crawl spaces. When is a basement not a basement but a crawl space? The term crawl space is used in sections regulating exposed foam plastic, protection of members from decay, and flood protection. Some clarification is necessary. At the hearings in Pittsburgh, one person speaking in opposition to this proposal said that they had 20-foot crawl spaces in some homes. That makes my point. I think a 20-foot crawl space is a basement and should be subject to requirements such as the need for smoke detectors. Some definition of the terms basement and crawl space is necessary for uniformity and clarity.

**RB19-02**

R202 (IBC 202)

Proposed Change as Submitted:

Proponent: Rick Davidson, City of Hopkins, MN, representing the Minnesota Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING ENERGIE AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Add new text as follows:

SECTION 202
DEFINITIONS

1. IRC 202 CRAWL SPACE. That portion of a building that is partly or completely below grade and having a ceiling height of less than 7 feet 6 inches (2286 mm).

2. IBC 202 CRAWL SPACE. That portion of a building that is partly or completely below grade and having a ceiling height of less than 7 feet 6 inches (2286 mm).

Proponent’s Reason: Currently there are no definitions to distinguish between spaces below grade that will potentially be used for habitable space in the future and those spaces that are not designed or intended for habitable space such as crawl spaces. The term crawl space is used in Section 317.1 but is not defined. It also provides direction to the building official of the proposed use of space below the first story such and as to the application of potential requirements such as egress windows.

**ITEM 1 (IRC)**
Committee Action: Disapproved

Committee Reason: The proposed definition inappropriately includes technical requirements. Also, it would impose a height restriction that is not justified.

Assembly Action: No Motion

**ITEM 2 (IBC)**
Committee Action: Disapproved

Committee Reason: For consistency with the action on code change RB17-02, Item 2.

Assembly Action: No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Davidson, City of Hopkins, representing the Minnesota Building Officials, requests Approved as Modified by this comment.

Modify proposal as follows:

1. IRC 202 Crawl space. That portion of a building that is partly or completely below grade and having a ceiling height of less than \( \geq 6 \) feet 6 inches (2286 mm) \( (2032 \text{ mm}) \).

2. IBC 202 Crawl space. That portion of a building that is partly or completely below grade and having a ceiling height of less than \( \geq 6 \) feet 6 inches (2286 mm) \( (2032 \text{ mm}) \).

Commenter’s Reason: The IRC does not currently have a definition for crawl space yet the term is used in several sections of the code. For example, the code exempts crawl spaces from the need for smoke detectors. There are also references to crawl spaces in regulations for protection of foam plastics, protection of structural members, and flood regulations. Yet there is no means to distinguish between a basement, which is defined as the portion of a building that is partly or completely below grade and what is traditionally thought of as a crawl space. This opens the door to building officials being challenged on their interpretation and enforcement of the code. The proposed definition will create a clear definition between basements and crawl spaces.

**RB23-02**

R202

Proposed Change as Submitted:

Proponent: David W. Cooper, representing Stairway Manufacturers Association

Add new text as follows:
SECTION 202
DEFINITIONS

WINDER. A tread with non-parallel edges in its width.

Proponent’s Reason: Webster's dictionary defines a winder as a tread in a winding stairway and a flier as a tread in a straight stairway. Although the ICC has no definition for winder it is clearly self evident that a winder is a type of tread not a type of stairway. Winder treads are used as components of stairs that change direction, just as fliers (straight treads) are components in straight stairs. A winder performs the same function as a tread but its shape allows the additional function of a gradual turning of the stairway direction. The tread depth of a winder at the walk line and the minimum tread depth at the narrow end can control the turn made by each winder.

Winder treads are found as components of many types of stairways that turn, circular, elliptical, spiral, and an infinite array of curved and geometrical winding configurations. These would be impossible to regulate as stairway types, (see figure 1.) if there were codes that could be applied. This infinite variety of stairway types are encountered as part of the building environment on a daily basis and the current code at best causes confusion and varying interpretations. The definition of the winder will add a key element that is missing from the code. This element can form the basis for regulations that can be applied to any turning stair.

It is the proponents desire to simplify the code language and reduce the confusion associated with regulating safe stair design and construction for all stairs by seeking to establish concise control of the two parameters that affect all stairs those being rise and tread depth at the walk line. Simple code language that regulates these two parameters will eliminate the need to regulate a plethora of stair types, which is the current direction of the code. Someone once said at a recent code hearing that you couldn’t build an elliptical stair because there is no code for it but you can build a circular stair because there is a code for it. I believe the speaker was trying to point out an oversight of the present code. Safe stairways can easily be designed within the shape of an ellipse. How preposterous would it be to express that stairs that turn within a rectangle should not be allowed, but stairs that turn within a square shape are permitted? This spatial comparison of polygons is similar to the comparison of an ellipse and a circle and illustrates that the shape of the stairwell should have no bearing on the safe design of the stair. In fact if the correct tread sizing parameters regulated all treads the turning of the stair would also be defined and controlled. The proposed definition in its singular and simple form initiates this process.

Recognizing that Section R314.4 Winders is currently positioned adjacent to the stair types R314.5 Spiral stairways and R314.6 Circular stairways could eliminate further confusion. This placement within the body of the code has added confusion by association and the lack of addressing winder tread depth in section R314.2 Treads and risers has added to the confusion by disassociation.

Presently the code does not clearly or effectively provide the necessary design parameters or minimum standards required for the many undefined stair types, nor would it seem feasible to describe them accurately. The addition of the definition of winder is the first step toward this proponent’s recommendation for a clearer understanding of the basic elements of stairways and the provision of a tool with which to affect safe stairway design and construction. By regulating the minimum depth of the tread and the depth at the walking line we clearly and succinctly describe the layout parameters for every stair type regardless of the shape of the stairway. By defining the winder as a tread it also allows for the application of slope and profile that currently are not always applied to winder treads because of their separation from the tread and riser section where these items are regulated. The definition of winder becomes the first step toward fully applying the other tread related criteria that should also apply to winder treads. To assure a complete understanding please consider this proposal in relationship to our proposals for R314.2 Treads and risers, R314.4 Winders, and R314.6 Circular stairways. (see Figure 1)
Figure 1. A Variety of Stair Designs Using a Combination of Winder and Flier (Straight) Treads
Each of the above stair shapes can be designed to be code compliant by applying the rise and tread depth rules at the walking line. There is no reason to try to establish codes for each of these stair shapes.

(End of figure 1.)

Figure 1 showing a variety of stair designs using a combination of straight treads (fliers) and winder treads, have been excerpted with the permission of the Stairway Manufacturers Association, P.O. Box 361806, Birmingham, AL 35236 from page six of the “SMA Visual Interpretation of the IRC 2000 Stair Building Code”. The complete booklet is available for download at www.stairways.org.

Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kermit C. Robinson, City of Portland, Oregon, representing the Oregon Building Officials Association, requests Approved as Modified by this comment.

Modify proposal as follows:

WINDER. A tread with non-parallel edges in its width.

Commenter’s Reason: A winder can have non-parallel edges in both its width and depth. Please look at the diagrams supplied by the original proponent. The definition, as written, is unclear as to what edges “in its width” are actually being referred to. The definition, if needed at all, needs to be simplified to be inclusive of all winder types. See also the public comment on E137-02.

RB44-02

R305.1 (IBC 1207.2)

Proposed Change as Submitted:

Proponent: Paul Hayward, representing City of Farmington, Utah

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE
1. IRC R305.1 (Supp) Minimum height. Habitable rooms, hallways, corridors, bathrooms, toilet rooms, laundry rooms and basements shall have a ceiling height of not less than 7 feet (2134 mm). The required height shall be measured from the finish floor to the lowest projection from the ceiling.

Exceptions:

1. Beams and girders spaced not less than 4 feet (1219 mm) on center may project not more than 6 inches (152 mm) below the required ceiling height, but shall not be less than 6 feet 8 inches (2032 mm) above the finished floor.

2. Ceilings in basements without habitable spaces may project to within 6 feet, 8 inches (2032 mm) of the finished floor. Ceilings in dwellings legally constructed prior to the adoption of this code may project to within 6 feet, 4 inches (1931 mm) of the finished floor.

(No change to numbers 3 and 4)

2. IBC 1207.2 Minimum ceiling heights. Occupiable spaces, habitable spaces and corridors shall have a ceiling height of not less than 7 feet 6 inches (2286 mm). Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet (2134 mm).

Exceptions:

1. In one-and two-family dwellings, beams and girders spaced not less than 4 feet (1219 mm) on center and projecting not more than 6 inches (152 mm) below the required ceiling height, but shall not be less than 6 feet 8 inches (2032 mm) above the finished floor.

2. Basement rooms in one-and two-family dwellings having a ceiling height of not less than 6 feet 8 inches (2033 mm), with not less than 6 feet 4 inches (1932 mm) of clear height under beams, girders, ducts, and similar obstructions. Ceiling in dwellings legally constructed prior to the adoption of this code may project to within 6 feet 4 inches (1931 mm) of the finished floor.

3. If any room in a building has a sloping ceiling, the prescribed ceiling height for the room is required in one-half the area thereof. Any portion of the room measuring less than 5 feet (1524 mm) from the finished floor to the finished ceiling shall not be included in any computation of the minimum area thereof.

4. Mezzanines constructed in accordance with 505.1

Proponent's Reason: This is a re-write of proposal RB19-01 that was disapproved. There needs to be a minimum standard for new construction, as many owners finished uninhabited space in basements into bedrooms, family rooms, etc. The phrase that refers to the adoption of the IRC will allow existing, non-complying situations to be completed on a case-by-case basis and will not perpetrate a standard of too low ceiling heights forever. Since the code body would not approve the 7 foot standard, this submittal seeks to establish it at 6 feet 8 inches, not 6 feet 4 inches. The basic minimum really ought to be the height of a door. Anything less creates sub-standard housing and is not in the public's interest.

ITEM 1 (IRC)

Committee Action: Disapproved

Committee Reason: The current exception in the code provides adequate headroom for general population of today. A need has not been established for this change.

Assembly Action: No Motion

ITEM 2 (IBC)

Committee Action: Disapproved

Committee Reason: The current text provides for a 7 foot 6 inch ceiling height. Applying Exception 1, the ceiling would be 7 feet. There is no demonstrated need to reduce the ceiling height another 4 inches. RB19-01, Item 2 was, in fact, approved and Exception 2 no longer exists.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Paul Hayward, City of Farmington, UT, requests Approved as Submitted.

Commenter's Reason: The issue is allowing 6’ 4” headroom in EXISTING dwellings. While change RB19-02 will deal with NEW buildings, it simply defines a “crawl space” but where does it eliminate Exception 2? How does Exception 2 “no longer exist?” Could we now have permission for a basement headroom dimension that is defined as a crawl space? Floor testimony in previous hearings stated that older, existing residential buildings have lower ceilings. This is seeking to keep a 6’ 8” minimum, not the 6’ 4” allowed in the currently worded Exception 2.

RB48-02
R309.3
Proposed Change as Submitted:

Proponent: Rick Davidson, City of Hopkins, representing Minnesota Building Officials

Delete without substitution:

R309.3 Floor surface. Garage floor surfaces shall be of approved noncombustible material.

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

THIS PROPOSAL ACHIEVES TECHNICAL CONSISTENCY BETWEEN THE IRC AND IBC. THE FOLLOWING IBC TEXT IS SHOWN FOR INFORMATION PURPOSES ONLY.

IBC 406.2.6 Floor surface. Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials.

Exception: Asphalt parking surfaces are permitted at ground level.

Proponent’s Reason: The purpose of this section is unclear. Are the liquids referenced flammable liquids or some other liquids? If they are flammable liquids is it appropriate to drain them out of the building where they will end up in a waterway? If they are flammable liquids, is there sufficient evidence to suggest that automobile fuel tanks leak with a frequency that warrants such a rule and leak sufficient volume? The infrequent fuel tank leaks that occur are typically so small that the resultant spill evaporates before it would get to a doorway. If the liquids referenced are not flammable liquids, is the concern over melted snow or rainwater draining off vehicles? In either case, many portions of the country may not be impacted by either snow or rainwater. How much slope is required? What is the term “other vehicles” to include? The IRC only requires floor surfaces to be noncombustible. This could be earth. Sloping an earthen floor makes no sense. The IRC does not require vehicle storage buildings to be subject to a similar rule even though many more vehicles may be involved. In areas of the country where monolithic garage slab construction is common, it is impossible to comply with this requirement. It becomes necessary to place the garage floor inside a perimeter foundation, which is more expensive and unnecessary.

Committee Action: Disapproved

Committee Reason: There is no substantiation for this change. The IRC drafting committee felt that there was a need for the sloping floor in the residential code.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Patrick Parsley, City of Fairmont, MN, representing the Minnesota Building Officials, requests Approved as Submitted.

Commenter’s Reason: In Pittsburgh the committee didn’t think the change was substantiated, however they were unable to explain the reason for the language calling for a sloped floor. We would reiterate that there is no reason for the language because the requirement is not found in the code for other occupancies and is unenforceable since there is no minimum slope required. Additionally, the present language requires this slope in a storage shed where only lawn mowers and garden tractors are stored. This is unnecessary language with no safety benefit.

RB49-02

R309.4 (IBC406.1.3)

Proposed Change as Submitted:

Proponent: Rick Davidson, City of Hopkins, representing Minnesota Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Delete without substitution:

1. IRC R309.4 Carports. Carports shall be open on at least two sides. Carport floor surfaces shall be of approved noncombustible material. Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.

Exception: Asphalt surfaces shall be permitted at ground level in carports.

The area of the floor used for parking of automobile or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

2. IBC 406.1.3 Garages and carports. Carports shall be open on at least two sides. Carport floor surfaces shall be of approved noncombustible material. Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.

Exception: Asphalt surfaces shall be permitted at ground level in carports.

The area of the floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.
Proponent’s Reason: The purpose of this section is unclear. Are the liquids referenced flammable liquids or some other liquids? If they are flammable liquids is it appropriate to drain them out of the building where they will end up in a waterway? If they are flammable liquids, is there sufficient evidence to suggest that automobile fuel tanks leak with a frequency that warrants such a rule and leak sufficient volume? The infrequent fuel tank leaks that occur are typically so small that the resultant spill evaporates before it would get to a doorway. If the liquids referenced are not flammable liquids, is the concern over melted snow or rainwater draining off vehicles? In either case, many portions of the country may not be impacted by either snow or rainwater. How much slope is required? What is the term “other vehicles” to include? The IRC only requires floor surfaces to be noncombustible. This could be earth. Sloping an earthen floor makes no sense. The IBC does not require vehicle storage buildings to be subject to a similar rule even though many more vehicles may be involved. In areas of the country where monolithic garage slab construction is common, it is impossible to comply with this requirement. It becomes necessary to place the garage floor inside a perimeter foundation, which is more expensive and unnecessary.

ITEM 1 (IRC)
Committee Action: Disapproved
Committee Reason: To be consistence with the committee action on RB48-02.
Assembly Action: No Motion

ITEM 2 (IBC)
Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.
Assembly Action: No Motion

Individual Consideration Agenda
This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

Public Comment:
Patrick Parsley, City of Fairmont, MN, representing the Minnesota Building Officials requests Approved as Submitted of Items 1 and 2.

Commenter’s Reason: In Pittsburgh the committee didn’t think the change was substantiated, however they were unable to explain the reason for the language calling for a sloped floor. We would reiterate that there is no reason for the language because the requirement is not found in the code for other occupancies and is unenforceable since there is no minimum slope required. Additionally, the present language requires this slope in a storage shed where only lawn mowers and garden tractors are stored. This is unnecessary language with no safety benefit.

Analysis: The following combinations of actions would achieve technical consistency between the IBC and the IRC:
Item 1 D Item 2 D
or
Item 1 AS Item 2 AS

RB51-02
R310.1 (IBC 1009.1)

Proposed Change as Submitted:
Proponent: Michael L. McReynolds, representing City of Oak Park, MI

Revise as follows:

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. IRC R310.1 (Supp) Emergency escape and rescue openings required. Basements with habitable space and every sleeping room shall have at least one openable emergency escape and rescue opening. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 44 inches (1118 mm) above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with Section 310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2.

2. IBC 1009.1 (Supp) General. In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue in Group R as applicable in Section 101.2 and Group I-1 occupancies. Basements and every sleeping rooms below the fourth story shall have at least one exterior emergency escape and rescue opening in accordance with this section. Such opening shall open directly into a public street, public alley, yard or court.

Exceptions:

1. In other Group R-3 occupancies as applicable in Section 101.2, buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. In other than Group R-3 occupancies as applicable in Section 101.2, sleeping rooms provided with a door to a fire-resistance-rated corridor having access to two remote exits in opposite directions.
3. The emergency escape and rescue opening is permitted to open onto a balcony within an atrium in accordance with the requirements of Section 404 provided the balcony provides access to an exit and the dwelling unit or sleeping unit has a means of egress that is not open to the atrium.
4. Basements with a ceiling height of less than 80 inches (2032 mm) shall not be required to have emergency escape and rescue windows.
5. High-rise buildings in accordance with Section 403.

**Proponent’s Reason:** There is no greater hazard by having habitable space in a basement than there is on any other floor level. There is no question that a sleeping room in a basement should have an egress window for emergency escape the same as is required on the first floor. With the requirement of smoke detectors as an early warning device and an egress window we can presume that someone would be alerted to a fire and could get out of the basement safely. Occupants that are awake and using other areas of a basement would be aware if a fire were to occur and would have ample time to exit the building.

There is a substantial cost to install these windows on an existing structure and difficulty in older developed areas with narrow lots. Cost and difficulty should never be an issue when it comes to safety but in the same respect code requirements should not be imposed that do not serve a reasonable purpose. Statistics show that in residential, people generally die in fires due to smoke inhalation. There is no evidence that having habitable space in a basement is a hazard, other than a sleeping room.

Code changes should be made to improve on the health, safety and welfare of the building occupants, especially when it is proven that the change will save lives. There is nothing in this section that explains where a window should be placed. Depending on the layout of a basement there is no guarantee that the window would be useful in case of a fire as is the case with a bedroom window.

**Public Comment 2:**

Michael L. McReynolds, City of Oak Park, MI, requests Approved as Submitted of Items 1 and 2.

**Commenter’s Reason:** Disagree with Assembly Action of disapproval for reasons previously stated.

Additionally, Section R303.1 requires habitable rooms to be provided with light and ventilation through doors and windows. Exception #1 of this section says that these areas need not be openable if mechanical ventilation is provided. Exception #2 goes further in eliminating the need for openings altogether if artificial lighting is provided. Therefore, in any other location in a residence, with the exception of a sleeping room, you could have habitable space with no windows.

There are no statistics that suggest that this is an unsafe condition including habitable space in a basement, other than in a sleeping room. To require windows in habitable space in a basement, other than a sleeping room, would make the code inconsistent and suggests that people are only at risk in habitable space in a basement.

The companion change, Section 1009.1, was approved by the committee and if R303.1 is not also approved there will be an inconsistency between the two codes.

**Assembly Action:** No Motion

**RB53-02**

**R311.5.3 (IBC 1003.3.3.3)**

**Proposed Change as Submitted:**

**Proponent:** David W. Cooper, representing Stairway Manufacturers Association

**Comment:**

**THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**

1. **IRC R311.5.3 (Supp) Stair treads and risers.** The maximum riser height shall be 7\(\frac{3}{4}\) inches (196 mm) and the minimum tread depth shall be 10 inches (254 mm). The riser measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread’s leading edge. The greatest tread depth within...
any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Winder treads shall have a minimum tread depth of 10" (254 mm) measured as above at a point 12 inches (305 mm) from the side where the treads are narrower and a minimum tread depth of 6" (152 mm). The greatest winder tread depth at the 12 inch walk line within any flight of stairs shall not exceed the smallest by more than 3/8" (9.5 mm).

R311.5.3.1 Dimensional uniformity. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

2. IBC 1003.3.3.3 Stair treads and risers. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. Stair tread depth shall be 11 inches (279 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Winder treads shall have a minimum tread depth of 11 inches (254 mm) measured at a right angle to the tread's leading edge at a point 12 inches (305 mm) from the side where the treads are narrower and a minimum tread depth of 10 inch (254 mm). The greatest winder tread depth at the 12 inch (305) walk line within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

Exceptions:
1. Circular stairways in accordance with Section 1003.3.3.7.
2. Winders in accordance with Section 1003.3.3.8
3. Spiral stairs in accordance with Section 1003.3.3.9.
4. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1008.9.2.
5. In occupancies in Group R-3, as applicable in Section 101.2, within dwelling units in occupancies in Group R-2, as applicable in section101.2, and in occupancies in Group U, which are accessory to an occupancy in Group R-3, as applicable in Section 101.2, the maximum riser height shall be 7.75 inches (197 mm), and the minimum tread depth shall be 10 inches (254 mm), the minimum winder tread depth at the walk line shall be 10 inches (254 mm), and the minimum winder tread depth shall be 6 inches (274 mm). A nosing not less than 0.75 inch (19.1 mm) but not more than 1.25 inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
6. See Section 3402.4 for the replacement of existing stairways.

Proponent's Reason: A winder is a type of tread. By this proponent’s proposed definition, please see the change submitted for Section R202, a winder is a tread with non-parallel edges in its width. A winder is a tread that is used in stairs that change direction. Winder treads are utilized in combination with fliers (straight treads) however the current section R311.5.8.2 (IBC 1003.3.3.8) Winders does not clearly state how the tread depth of a winder is measured. That is like all other treads “Square to the leading edge”.

By including winder treads in Section R311.5.3 (IBC 1003.3.3.3)Tread and risers we are able to gain a better understanding of how the parameters that are being regulated relate to similar components in a clear fashion without the need to cross-reference other sections of this code. The effort here is to put every thing you wanted to know about treads but were afraid to lookup, in one spot. Further confusion is also eliminated here by directly associating the 3/8” tolerance to the part being controlled rather than as a forgotten trailing message or addendum to the paragraph. In addition to these clarifications the subsection R311.5.3.2 profile, which follows section R311.5.3 Treads and risers now makes clear association with winder treads and the need to assure a uniform profile at the leading edge.

This proponent would also offer that with our proposed definition of winder and this proposal accepted an even greater simplification of purpose can be established by the deletion of sections R311.5.8.2 (IBC 1003.3.3.8) Winders because the controlling parameters have been added to the Treads and risers section making the Winders section obsolete and unnecessary. For the same reasons section R311.5.8 (IBC 1003.3.3.7) Circular stairways could also be deleted. Such reclassification would not only broaden the scope of the text but would also validate the most common applications of winder tread regulation.

With these logical changes this single paragraph along with the definition of winders as a tread now provides all the essential parameters and controlling nomenclature necessary to regulate safe walking stairs regardless of shape without shape definitions.

(See Figure 1)
Figure 1. A Variety of Stair Designs Using a Combination of Winder and Flier (Straight) Treads
Each of the above stair shapes can be designed to be code compliant by applying the rise and tread depth rules at the walking line.

ITEM 1 (IRC)
Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.
Assembly Action: No Motion

ITEM 2 (IBC)
Committee Action: Approved as Modified
Modify proposal as follows:
Retain Section 1003.3.3.3, current exception 2 that reads: Winders in accordance with Section 1003.3.3.8.
Committee Reason: The change was approved based on the reason statement with a modification to retain current exception 2. The exception is needed to reference Section 1003.3.3.8 regarding winders.
Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:
Kermit C. Robinson, City of Portland, OR, representing the Oregon Building Officials Association, requests Approved as Modified by this comment.

Modify proposal as follows:
Part 1 – IRC R311.5.3 (Supp) Stair treads and risers.
R311.5.3.1 Riser height. The maximum riser height shall be 7 ¾ inches (196 mm) and the maximum tread depth shall be 10 inches (254 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).
R311.5.3.2 Tread depth. The maximum tread depth shall be 10 inches (254 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread’s leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Winder treads shall have a minimum
tread depth of 10 inches (254 mm) measured as above at a point 12 inches (305 mm) from the side where the treads are narrower, and Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point. Within any flight of stairs, the greatest winder tread depth at the 12 inch (305 mm) walk line within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

Part 2 IBC 1003.3.3.3 Stair treads and risers . . . No change from the Committee Recommendation.

Commenter’s Reason: The concept of the code change approved by the committee is appropriate, however, the approved code change is editorially flawed and difficult to understand because of missing text and compound sentences. The primary change is to split the section into separate parts for riser height and tread depth. This results in splitting the first sentence between the two subsections. In the riser section, “shall be” is left out of the proponent’s submittal, probably unintentionally. In the tread depth section, the last two sentences have been split into 3 sentences and reorganized simply to make them more readable. Many of the measurement protocols needed to be corrected.

RB54-02
R311.5.4

Proposed Change as Submitted:

Proponent: Stephen Thomas, Cherry Hills Village, CO, representing Colorado Chapter ICC

Add new text as follows:

R311.5.4 (Supp) Landings for stairways. There shall be a floor or landing at the top and bottom of each stairway. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exception: At the top of an interior flight of stairs, provided a door does not swing over the stairs.

The width of each landing shall not be less than the stairway served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel.

Proponent’s Reason: The current code would permit a straight run to extend up to three stories with no intermediate landings. This proposed change duplicates the requirements of the IBC. The need for landings at a 12 foot interval is necessary to provide a resting area for people climbing the stairs and provide an area where people falling down stairs won’t fall three floors.

Committee Action: Approved as Submitted

Committee Reason: The current code would permit a straight run to extend up to three stories with no intermediate landings. This proposed change duplicates the requirements of the IBC. The need for landings at a 12 foot interval is necessary to provide a resting area for people climbing the stairs and provide an area where people falling down stairs won’t fall three floors.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle, Washington, requests Approved as Modified by this comment.

Modify proposal as follows:

R311.5.4 (Supp) Landings for stairways. There shall be a floor or landing at the top and bottom of each stairway. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exception: A floor or landing is not required at the top of an interior flight of stairs, provided a door does not swing over the stairs.

A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

The width of each landing shall not be less than the stairway served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel.

Commenter’s Reason: This is an editorial change. The existing exception means that no landing is required at the top of a stairway, and should remain attached to the language to which it relates. This proposal also makes the exception into a complete sentence to clarify its meaning.

RB56-02
R311.5.6

Proposed Change as Submitted:

Proponent: Rick Davidson, City of Hopkins, representing Minnesota Building Officials

Revise as follows:

R311.5.6 (Supp) Handrails. Handrails shall be provided on at least one side of each stairway with two or more risers.

Proponent’s Reason: While the current handrail requirements may be appropriate for commercial uses, they are overly restrictive for private residences. They result in decks that require handrails but no guardrail. They result in sunken rooms with two steps that extend across the width of a room with a 10-inch handrail on a wall behind furniture that will never be used.

Committee Action: Disapproved

Committee Reason: There is no justification provided to change from 2 risers to 4 risers.

Assembly Action: No Motion
Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Gilbert Gonzales, Murray City Corporation, representing the Utah Chapter ICC, requests Approved as Submitted.

Commenter's Reason: The committee's disapproval was based on no justification to change from 2 risers to 4. We were unable to find the justification to go from 4 to 2 in any of the original drafting committee proposals.

(1) The 1999 Standard Building Code, Section 1007.5.1 only required handrails on stairways having four or more risers.

(2) The 1995 CABO 1 & 2 Family Dwelling Code required handrails with 3 or more risers.

(3) The 1997 Uniform Building Code, Section 1003.3.3.6, exception (3) stated stairways having less than 4 risers and serving one individual dwelling need not have handrails.

Public Comment 2:

Patrick Parsley, City of Fairmont, MN, representing the Minnesota Building Officials, requests Approved as Submitted.

Commenter's Reason: At the hearings the committee failed to see the logic within the language of the proposal. There is no code requirement for a guard at the edge of a floor or raised platform that is less than 30” above the adjacent grade. If we are not concerned about falls of less than 30” in height when no steps are involved, where is the inherent risk in not providing a handrail on a stair which has an overall height of less than 30” or in the proposal no higher than 23.25”(7.75 X 3). It is obvious that a fall on this small of a stair will be no more dangerous than a fall from a 30” high deck. Both a guard and a handrail are provided to prevent falls therefore their locations should be coordinated.

RB57-02
R311.5.6

Proposed Change as Submitted:

Proponents: John McLeod, representing Greenville County, SC and Greenville County Home Builders Assn.

Michael T. Wichman, representing SBCCI-IRC Building and Energy Code Action Committee

Revise as follows:

R311.5.6 (Supp) Handrails. Handrails shall be provided on at least one side of each stairway with two or more risers.

Proponent's Reason: (McLeod) This will keep the current requirements of CABO. At three risers a handrail would be required but not on most landings a guardrail would not be required. Thus having a handrail only going up the steps looking out of place and in some cases removed by the owner. Lowering the requirement would only cause more to be removed. There has not been any evidence that this is a safety hazard, or cause more falls. The only reason has been it put it in line with the International Building Code. That's why we have an International Residential Code is to have differences between homes and businesses.

(Wichman) Handrails for three risers is the requirement in the 1995 CABO one and Two Family Dwelling Code and the 1998 International One-and Two-Family Dwelling Code. This language has not been demonstrated to cause a hazard and is adequate for minimum code requirement.

Committee Action: Disapproved

Committee Reason: To be consistent with the committee action on RB56-02.

Assembly Action: Approved as Submitted

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful and a public comment was submitted.

Public Comment 1:

Patrick Parsley, City of Fairmont, MN, representing the Minnesota Building Officials, requests Approved as Submitted.

Commenter's Reason: At the hearings the committee failed to see the logic within the language of the proposal. There is no code requirement for a guard at the edge of a floor or raised platform that is less than 30” above the adjacent grade. If we are not concerned about falls of less than 30” in height when no steps are involved, where is the inherent risk in not providing a handrail on a stair which has an overall height of less than 30” or in the proposal no higher than 15.5”(7.75 X 2). It is obvious that a fall on this small of a stair will be no more dangerous than a fall from a 30” high deck. Both a guard and a handrail are provided to prevent falls therefore their locations should be coordinated.

Public Comment 2:

Gary W. Walker, PE, Walker Engineering, Inc., representing the Manufactured Housing Institute, requests Approved as Submitted.

Commenter's Reason: The maximum height of a riser under the International Residential Code is 7-¾” (Section R314.2 Treads and risers). Three risers will generate a maximum elevation change of 23-¼” (3 x 7-¾”). A guardrail is required for porches, balconies, and floor surfaces that are more than 30” above the floor or grade below (Section R316 GUARDS). The requirement that a handrail is to be installed on the stair with three or more risers is consistent with the protection required for elevated surfaces.

The proponent of RB57-02 has identified the problem of having only a handrail when providing the connection between two surfaces. When the two surfaces are less than 30” apart vertically, the only code required safety feature to prevent falls is the handrail. No guardrail is required. For porches, decks, etc. the handrail can
create a safety hazard as an obstruction or under some conditions may cause the individual to not correctly identify the side to which the stair is located.

**RB59-02**

**R311.5.6.2**

*Proposed Change as Submitted:*

**Proponent:** Rick Davidson, representing City of Hopkins, MN

**Revise as follows:**

**R311.5.6.2 (Supp) Continuity.** Handrails for stairways shall be continuous for the full length of the stairs, from a point directly above the top riser of the flight to a point directly above lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1 1/2 inch (38 mm) between the wall and the handrails.

**Proponent’s Reason:** This is an unnecessary requirement for residential construction. There are two recurring arguments that are made. (a) The railings in stair enclosures without returns may snag fire hoses. This won’t be a problem in a dwelling. (b) The railings may snag clothing. It is hard to visualize how this would occur and be a hazard, particularly at the bottom of a stair. Trouser pockets face the wrong direction unless one wears them backwards. The same is true for jackets. I suppose one could come up with some type of clothing design that would be prone to snagging but this would be a unique situation that the code should not have to address.

**Committee Action:** Disapproved

**Committee Reason:** There is no justification provided to delete this requirement. There are enough people that do wear some articles, such as a backpack, that would snag on the end of a handrail.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Rick Davidson, City of Hopkins, MN, requests Approved as Submitted.

**Commenter’s Reason:** This is an unnecessary requirement for residential construction. There are two recurring arguments that are made as the reason for the rule. First, the railings in stair enclosures may snag fire hoses. This won’t occur in residential dwellings. Second, railings may snag clothing. It is hard to visualize how this would occur and be a hazard, particularly at the bottom of a stair. Trouser pockets face the wrong direction to be snagged unless one wears their pants backwards. The same is true for jackets. The IRC Committee argued that there was no justification to delete the section and that people may wear some type of clothing, such as a backpack, that would snag at the end of a handrail. People don’t routinely wear a backpack when lounging around their home. And, if they do wear a backpack or other flowing type of garment, it is more likely to be caught on a newel post than on the end of a handrail. Maybe the justification for eliminating the requirement is not overwhelmingly strong, but the reason for maintaining it seems weak at best. This requirement should be deleted.

**RB65-02**

**R317.1.1**

*Proposed Change as Submitted:*

**Proponent:** Robert D. Lee, Town of Cave Creek, representing Arizona Building Officials

**Add new text as follows:**

**R317.1.1 Alterations, repairs and additions.** When interior alterations, repairs or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be provided with smoke alarms located as required for new dwellings; the smoke alarms shall be interconnected and hard wired.

**Exception:**

1. Smoke alarms in existing areas shall not be required to be interconnected and hard wired where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space, or basement available which could provide access for hard wiring and interconnection without the removal of interior finishes.

2. Repairs to the exterior surfaces of dwellings are exempt from the requirements of this section.

3. When the value of the alterations or repairs requiring a permit is less than $1000 and the work is limited to areas other than the rooms or areas listed in Section 317.1, the installation of smoke alarms is not required.

**Proponent’s Reason:** This new exception would exclude those circumstances where the work that requires a permit is relatively insignificant and have such a scope as to be not related to the rooms or areas normally requiring the installation of smoke alarms.

**Committee Action:** Approved as Submitted

**Committee Reason:** This new exception would exclude those circumstances where the work that requires a permit is relatively insignificant and have such a scope as to be not related to the rooms or areas normally requiring the installation of smoke alarms.
Assembly Action: Disapproved - Motion Failed

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gilbert Gonzales, Murray City Corporation, representing the Utah Chapter ICC, requests Disapproved.

Commenter’s Reason: This artificial limit will result in code enforcement problems, as the value of the work will be understated to avoid installing the smoke detectors. Smoke detectors are the most effective (and cost-effective) means to reduce loss of life in fires. No opportunity to require their installation should be passed by, especially when the item costs as little as $5.

RB68-02
R321.1

Proposed Change as Submitted:


Revise as follows:

R321.1 Two-family dwellings. Dwelling units in two-family dwellings shall be separated from each other by wall and/or floor assemblies of having not less than a 1-hour fire-resistive resistance rating when tested in accordance with ASTM E119. Fire-resistance-rated floor-ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend to the underside of the roof sheathing.

Exception: A fire resistance rating of ½ hour shall be permitted in buildings equipped throughout with an electrically supervised automatic sprinkler system installed in accordance with NFPA 13.

Proponent’s Reason: It is our understanding that the exception to Section R321.1 which allows a ½ hour fire resistance rating in lieu of the 1 hour fire resistance rating between dwelling units in two-family dwellings where the buildings are equipped with an NFPA 13 sprinkler system comes from the 1999 BOCA National Building Code. It should be noted that Section 924.1 of that code would require the automatic sprinkler system used for the ½ hour reduction in fire resistance rating of dwelling unit separations to be supervised electrically by a central station system, a proprietary system, a remote station system, or a supervisory service which will cause the actuation of an alarm at a constantly attended location in accordance with NFPA 72. We also believe that where a reduction in fire resistance is allowed by the code for the installation of an NFPA 13 sprinkler system, the system should be supervised in order to enhance its performance to assure that it will activate should a fire occur and control the fire. This is especially important for two-family dwellings which may be under separate ownership so that the fire resistance separation is not totally the responsibility of the owner of the dwelling unit on the opposite side. In other words, the owner on one side of the 1-hour separation allowed to be reduced to ½ hour is relying on the adjacent owner or occupant to maintain the sprinkler system ensuring that it is operable and turned on in order to provide the proper degree of fire resistive separation. Sprinkler performance statistics clearly indicate that supervised sprinkler systems are much less likely to fail than unsupervised systems.

It should be noted that a ½ hour fire resistance rating can be achieved with a single layer of 3/8” gypsum wallboard installed on both sides of wood studs or with 15/32” wood structural panels (plywood) attached to wood studs or with 3/8” wood structural panels (plywood) attached to wood studs with insulation in the stud cavities. These rated assemblies are based on calculated fire resistance ratings determined in accordance with Section 720.6 of the 200 International Building Code (IBC). This compares to a 1 hour wall which can be achieved with a single layer 5/8” Type X gypsum wallboard installed on both sides of wood studs. With this significant reduction in fire resistance, in our opinion, it is essential that the automatic sprinkler system be electrically supervised in order to allow the 50% reduction in required fire resistance rating to ½ hour.

Committee Action: Approved as Modified

Modify proposal as follows:

R321.1 Two-family dwellings. Dwelling units in two-family dwellings shall be separated from each other by wall and/or floor assemblies having not less than a 1-hour fire-resistance rating when tested in accordance with ASTM E119. Fire-resistance-rated floor-ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend to the underside of the roof sheathing.

Exception: A fire resistance rating of ½ hour shall be permitted in buildings equipped throughout with an electrically supervised automatic sprinkler system installed in accordance with NFPA 13.

Committee Reason: Based on proponent’s published reason. The modification was made because NFPA 13 addresses “electrically supervised” and adding this term to the exception would be redundant.

Assembly Action: No Motion

Public Comment:


Commenter’s Reason: The Committee recommended Approval as Modified for this code change by the deletion of the phrase “electrically supervised” which they said was already addressed by NFPA 13 and, therefore, would be redundant. However, NFPA 13-1999 only requires electrically supervised sprinkler systems for high-rise buildings in accordance with Section 5-15.1.6 and high-piled/high-rack storage buildings in accordance with Section 5-15.1.7. It is also interesting to note that a local water flow alarm is only required for a sprinkler system that has more than 20 sprinklers. Thus, there could be a significant number of one and two family dwellings that wouldn’t even have the local water flow alarm device. Furthermore, a descriptive note to the NFPA 13 requirement for a local water flow alarm indicates that it is highly desirable to supplement the local fire alarm with a central station protective signaling system. However, such a system is not required except as previously indicated.
RB69-02
R321.2.1

Proposed Change as Submitted:

Proponent: Rick Davidson, representing City of Hopkins, MN

Add new text as follows:

R321.2.1 Continuity. The common wall for townhouses shall be continuous from the foundation to the underside of the roof sheathing, deck, or slab and shall extend the full length of the common wall including walls extending through and separating attached accessory structures.

Proponent’s Reason: When the IRC Committee approved amendments to the “townhouse” definition removing references to property lines, it eliminated controls on the separation of garages attached to townhouses. Interpreted literally, section 321.2.1 requires that the common wall of the “townhouses” be continuous for the length of the common wall for the townhouse. “Townhouse” is defined as a dwelling unit, not a garage. There is no limitation on the area of garages. It appears that the code would permit a row of townhouses that must be separated by two one-hour or one two-hour fire-resistance-rated wall to be connected to an unlimited area garage that is only required to be separated from the dwelling units by a single layer of \( \frac{1}{2} \) inch gypsum board on the garage side of the townhouses. The proposed amendment clarifies that the separation is to include a separation of attached garages.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Robertson, Chesterfield, VA, representing the Virginia Building & Code Officials Association, requests Disapproved.

Commenter’s reason: By using the term “accessory structures” in the added language, this change could be construed to require that a rated, common wall be constructed as part of an exterior deck.

RB71-02
R322.1

Proposed Change as Submitted:


Add new text as follows:

IRC R322.1 Moisture Control. In all framed walls, floors and roof/ceilings comprising elements of the building thermal envelope, a vapor retarder shall be installed on the warm-in-winter side of the insulation.

Exceptions:

1. In construction where moisture or its freezing will not damage the materials.
2. Where the framed cavity or space is ventilated to allow moisture to escape.
3. In counties identified with footnote a in Table N 1101.2.
4. Where other approved means to avoid condensation in unventilated framed wall, floor, roof and ceiling cavities are provided.

THIS PROPOSAL ACHIEVES TECHNICAL CONSISTENCY BETWEEN THE IRC AND IBC. THE FOLLOWING IBC TEXT IS SHOWN FOR INFORMATION PURPOSES ONLY.

IBC 1403.3 Vapor retarder. An approved interior noncorrodible vapor retarder shall be provided. Vapor retarders shall be tested in accordance with ASTM E 96.

Exceptions:

1. Where other approved means to avoid condensation and leakage of moisture are provided.
2. Plain and reinforced concrete or masonry exterior walls designed and constructed in accordance with Chapter 19 or Chapter 21, respectively.

Proponent’s Reason: The proposed new Exception 4 is based on Exception 1 to Section 1403.3 of the 2000 International Building Code. Identical language is also found in Exception 3 to Section 502.1.1 and in Exception 3 to Section 802.1.2 of the 2000 International Energy Conservation Code. This exception simply allows another performance option for the use of insulation materials without vapor barriers or ventilation within the exterior walls, crawl spaces, cathedral ceilings, and attics of buildings which can be shown by tests and evaluations to prevent condensation within the insulated space. Presently, the Cellulose Insulation Manufacturers Association (CIMA) has initiated a study to develop the appropriate test protocols and evaluation procedures to demonstrate that cellulose insulation may be used under these conditions without causing condensation within the insulated cavity. The information from that study, when it is completed, will be made available to the Committee at least 30 days prior to the Public Hearings in April, 2002, and will also be available by request of any interested parties.

This concept is especially appropriate for cellulose installation although it is not limited to just that type of insulation. In fact, the exception is performance based and specifically allows the code official to consider an alternative to the vapor retarder requirement.
In fact, this approach is already being allowed in many states throughout the country from Virginia to California.

**Committee Action:** Disapproved

**Committee Reason:** The committee is concerned about adding an exception that might allow a method that could be conducive to formation of mold. The use of an alternate method is allowed in the code now. Also, the proponent did not provide the supporting documentation to the committee in time to allow for an adequate review.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Gary W. Walker, PE, Walker Engineering, Inc., representing the Manufactured Housing Institute, requests Approved as Submitted.

**Commenter’s Reason:** This exception is permitted in the International Building Code under Section 1403.3 exception #1. The same exception should be available under the International Residential Code. The proposed exception differs only in that it specifically references “framed wall, floor, roof and ceiling cavities”. There is nothing in this exception that permits the growth of mold any more than the same exception in the IBC. Both codes should have consistent requirements.

**Proposed Change as Submitted:**

R323.1

**Proponent:** George J. Lippert, representing City of Papillion, NE

**Revise as follows:**

R323.1 Location Required. In areas subject to decay damage as established by Table R301.2a, the following locations shall require the use of an approved species and grade of lumber, pressure treated in accordance with AWPA C1, C2, C3, C4, C9, C14, C15, C16, C22, C23, C24, C28, C33, P1, P2 and P3, or decay-resistant heartwood of redwood, black locust, or cedars.

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches (457 mm) or wood girders when closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.

2. All sills or plates that rest on concrete or masonry exterior walls and are less than 8 inches (203 mm) from the exposed ground.

3. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated from such slab by an impervious moisture barrier.

4. through 7. (No change)

**THIS PROPOSAL ACHIEVES TECHNICAL CONSISTENCY BETWEEN THE IRC AND IBC. THE FOLLOWING IBC TEXT IS SHOWN FOR INFORMATION PURPOSES ONLY.**

**IBC 2303.1.8 Preservative-treated wood.** Lumber, timber, plywood, piles and poles supporting permanent structures required by Section 2304.11 to be preservative-treated shall conform to the requirements of the applicable AWPA Standard C1, C2, C3, C4, C9, C14, C15, C16, C22, C23, C24, C28, C31, C33, and M4, for the species, product, preservative and end use. Preservatives shall conform to AWPA P1/P13, P2, P5, P8 and P9. Lumber and plywood used in wood foundation systems shall conform to Chapter 18.

**Proponent’s Reason:** Rational is provided by reference to the above three included clauses.

1. The distances to ground contact are fairly well established in research and practice. See the Requirements for ventilation of crawl spaces and the reduction of such ventilation requirements when using a vapor barrier aid in reducing moisture/wood contact. See Section R408, IRC.

2. The is really no predictable and reliable limit to which moisture can rise in concrete or concrete block construction. This component is always in contact with the ground. See substantiation section.

3. The key issue in this is the existence of a vapor barrier below the slab to prevent the rise of moisture into the concrete; this is not practiced extensively. The wording is acceptable as it is written and, considering emphasis on the exception, it relates to “all concrete in contact with ground” concept with or without depth. What if an 18” slab in ground contact would be proposed? It would still require that the “first wood” in contact need be pressure treated unless the moisture source is interrupted.

Ground moisture is principal agent of decay which we need to deal with. Concrete is porous and transmits moisture in either liquid or vapor form. Moisture is transmitted by capillary rise in soil and in all porous materials. Where a barrier such as a different material (wood sill) is encountered, the moisture condenses and collects and is absorbed in to the wood. Decay fungi thrive on damp or wet wood.

The idea of an upper limit as in item No. 2 defies scientific reason. Moisture transmission is simply a supply of water and path of least resistance movement process. In partial or unfilled concrete block walls, moisture vapor can travel upward to considerable heights. The same is true with solid concrete walls but possibly to a lesser degree and is limited in the continuation of supply of moisture and capillary pressure.

In recent discussions with Dr. Jerrold Winandy, Research Engineer, USDA Forest Products Laboratory, on this topic, Dr. Winandy stated he cannot support a limit on the height of moisture rise in concrete and advocates the need for a resistant material to stop the moisture rise. Dr. Winandy suggested extreme situations to illustrate the
point. Untreated sill plates and sleepers and floor nailers will work fine in a dry climate (Say Phoenix), until extensive lawn irrigation may take place and then, depending on porosity of the soil, pressure treated plates are likely to be needed to prevent decay from occurring. He related that all models of identifying locations of where moisture may or may not be present sufficient to continuously invade concrete structures must recognize the variables of added moisture and soil conditions. Australian scientists conducted extensive research into this issue in attempts to recommend similar code statements and recognize the major issue of soil moisture availability.

In discussions with John Hall of the American Wood Preservation Association he said they could not support the 8 inch limit on exterior sills as height is not the issue.

According to Karl Depps, ICBO technical staff, Whittier CA office, IBC and all subsequent issues of UBC do not support the 8" limit on exterior walls. The code refers rather to all wood in contact with concrete that is in direct contact with the ground be pressure treated or naturally rot resistant. He further related they had no corporate records of when and how the 8 inch concept got in to the CABO and it’s continuation into the IRC. He surmised that it came from one of the other code bodies involved with CABO and was never challenged. He said their staff supports the elimination of this clause as it is in conflict with reason. He said that Los Angles Co is proposing or has amended IRC to eliminate the limit on exterior walls. He further suggested that we propose making this code change more universal through the regular channels.

Finally, the revision would provide consistency between the provisions for the protection against decay provision in Section 2304.11, IBC and the R323.1, IRC.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joseph Knarich, National Association of Home Builders, requests Approved as Modified by this comment.

Modify proposal as follows:

R323.1 Location Required.

R323.1 Location Required. In areas subject to decay damage as established by Table R301.2a, the following locations shall require the use of an approved species and grade of lumber, pressure treated in accordance with AWPAC1, C2, C3, C4, C9, C15, C18, C22, C23, C24, C28, C33, P1, P2 and P3, or decay-resistant heartwood of redwood, black locust, or cedars.

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches (457 mm) or wood girders when closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.

2. All sills or plates wood framing members that rest on concrete or masonry exterior foundation walls and are less than 8 inches (203 mm) from the exposed ground.

3. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated from such slab by an impervious moisture barrier.

4. through 7. (No change)

Commenter’s Reason: This proposed modification would create technical consistency with the IBC section 2304.11, as desired by the proponent. In addition, it would eliminate confusion that may have arisen due to redundant references to sills from the original proposal as well as eliminating the potential misinterpretation that wall framing members have to be constructed from pressure-treated lumber in all locations.

RB80-02
R403.1.4.1

Proposed Change as Submitted:

Proponent: Pat Parsley, representing the Minnesota Building Officials

Revise as follows:

R403.1.4.1 (Supp) Frost Protection. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extending below the frost line specified in Table R301.2(1);
2. Constructing in accordance with Section R403.3;
3. Constructing in accordance with ASCE 32-01; and
4. Erecting on solid rock.

Exception:

(1) Freestanding accessory structures with an area of 400 square feet (37 m$^2$) or less and an eave height of 10 feet (3048 mm) or less shall not be required to be protected.

(2) Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

Footings shall not bear on frozen soil unless such frozen condition is of a permanent character.

Proponent’s Reason: The purpose of this proposal is to eliminate confusion regarding the need for frost depth foundations for unattached decks.

Committee Action: Approved as Submitted
Committee Reason: The purpose of this proposal is to eliminate confusion regarding the need for frost depth foundations for unattached decks.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Robertson, Chesterfield County, VA, representing the Virginia Building and Code Officials Association, requests Disapproved.

Commenter’s Reason: As written, this exception would permit an unattached deck of unlimited size to be constructed on a footing that is not extended to protect it from freezing. Large, complex, multi-level decks are not uncommon in today’s market.

RB82-02
R403.1.6, R403.1.6.1, R602.11.1

Proposed Change as Submitted:

Proponent: Building Seismic Safety Council (BSSC), representing BSSC Code Resource Support Committee, Washington, DC

Revise as follows:

R403.1.6 Foundation anchorage. When braced wall panels are supported directly on continuous foundations, the wall wood sill plate or cold-formed steel bottom track shall be anchored to the foundation in accordance with this section. In Seismic Design Categories D_1 and D_2, the additional anchorage requirements of Section R602.11.1 shall apply for wood framing. In Seismic Design Categories D_1 and D_2, where continuous wood foundations in accordance with Section R404.2 are used, the force transfer shall have a capacity equal to or greater than the connections required by Section R602.11.1 or the braced wall panel shall be connected to the wood foundations in accordance with the braced wall panel to floor fastening requirements of Table R602.3(1).

The wood sole plate at exterior walls on monolithic slabs and wood sill plate shall be anchored to the foundation with anchor bolts spaced a maximum of 6 feet (1829 mm) on center. Anchor bolts shall also be located within 12 inches (305 mm) from the ends of each plate section. In Seismic Design Categories D_1 and D_2, anchor bolts shall also be spaced at 6 feet (1829 mm) on center and located within 12 inches (305 mm) from the ends of each plate section at interior braced wall lines when required by Section R602.10.9 to be supported on a continuous foundation. Bolts shall be at least ½ inch (12.7 mm) in diameter and shall extend a minimum of 7 inches (178 mm) into masonry or concrete. Interior bearing wall sole plates on monolithic slab foundations shall be positively anchored with approved fasteners. A nut and washer shall be tightened on each bolt to the plate. Sills and sole plates shall be protected against decay and termites where required by Sections R322 and R323. Cold-formed steel framing systems shall be fastened to the wood sill plates or anchored directly to the foundation as required in Section R505.3.1 or R603.1.1.

Exception: Foundation anchor straps, spaced as required to provide equivalent anchorage to ½-inch-diameter (12.7 mm) anchor bolts.

R403.1.6.1 Foundation anchorage in Seismic Design Categories C, D_1, and D_2. In addition to the requirements of Section R403.1.6, the following requirements shall apply to light-wood frame structures in Seismic Design Categories C, D_1, and D_2:

1. Plate washers conforming to Section R602.11.1 a minimum of 2 inches by 2 inches by 3/16 inch (51 mm by 51 mm by 4.8 mm) thick shall be used on each bolt.

2. Interior braced wall plates shall have anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) from the ends of each plate section when supported on a continuous foundation. Anchor bolts shall be located within 12 inches (305 mm) from the ends of each plate section at interior bearing walls, interior braced wall lines and at all exterior walls.

3. Interior bearing wall sole plates shall have anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) from the ends of each plate section when supported on a continuous foundation.

4. The maximum anchor bolt spacing shall be 4 feet (1219 mm) for buildings over two-story in height-structures.

5. Stepped cripple walls shall conform to Section R602.11.3.

6. Where continuous wood foundations in accordance with Section R404.2 are used, the force transfer shall have a capacity equal to or greater than the connections required by Section R602.11.1 or the braced wall panel shall be connected to the wood foundations in accordance with the braced wall panel-to-floor fastening requirements of Table R602.3(1).
**R602.11.1 Wall anchorage.** Braced wall line sills shall be anchored to concrete or masonry foundations in accordance with Sections R403.1.6 and R602.11. In Seismic Design Categories C, D, and Dₚ. Plate washers, a minimum of 3/16 inch by 2 3 inches by 2 3 inches (4.8 mm by 76 mm by 76 mm) in size, shall be provided between the foundation sill plate and the nut.

*Proponent’s Reason:* This code change deletes a conflicting steel plate washer size in Section R403.1.6, and refers to a corrected size in R602.11.1. Section R403.1.6 is editorially reformatted to put additional requirements for high seismic zones in the appropriate subsection. The Seismic Design Category for seismic detailing is modified from Seismic Design Category D₁ to Seismic Design Category C in order to correspond to the 2000 NEHRP Recommended Provisions triggers for steel plate washers and closer spacing between braced wall line. Refer to 2000 NEHRP Recommended Provisions Section 12.5.3.

**Committee Action:** Approved as Modified

**Modify proposal as follows:**

**R403.1.6.1 Foundation anchorage in Seismic Design Categories C, D₁ and D₂.** In addition to the requirements of Section R403.1.6, the following requirements shall apply to wood light-frame structures in Seismic Design Categories C, D₁ and D₂: and wood light-frame townhouses in Seismic Design Category C:

1. Plate washers conforming to Section R602.11.1 shall be used on each bolt.
2. Interior braced wall plates shall have anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) from the ends of each plate section when supported on a continuous foundation.
3. Interior bearing wall sole plates shall have anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) from the ends of each plate section when supported on a continuous foundation.
4. The maximum anchor bolt spacing shall be 4 feet (1219 mm) for buildings over two stories in height.
5. Stepped cripple walls shall conform to Section R602.11.3.
6. Where continuous wood foundations in accordance with Section R404.2 are used, the force transfer shall have a capacity equal to or greater than the connections required by Section R602.11.1 or the braced wall panel shall be connected to the wood foundations in accordance with the braced wall panel-to-floor fastening requirements of Table 602.3(1).

**R602.11.1 Wall anchorage.** Braced wall line sills shall be anchored to concrete or masonry foundations in accordance with Sections R403.1.6 and R602.11. In Seismic Design Categories C, D₁ and D₂. For all buildings in Seismic Design Categories D₁ and D₂ and townhouses in Seismic Design Category C, plate washers, a minimum of 1/4 inch by 3 inches by 3 inches (6.4 mm by 76 mm by 76 mm) in size, shall be provided between the foundation sill plate and the nut.

*Committee Reason:* Based on proponent’s published reason. The modification was made to clarify the application to townhouses in Seismic Design Category C.

**Assembly Action:** No Motion

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*R403.3 Frost Protected Shallow Foundations.** For buildings where the monthly mean temperature of the building is maintained at a minimum of 64° F (18°C), footings are not required to extend below the frost line when protected from frost by insulation in accordance with Figure R403.3(1) and Table R403.3. Foundations protected from frost in accordance with Figure R403.3(1) and Table R403.3 shall not be used for unheated spaces such as porches, utility rooms, garages and carports, and shall not be attached to basements or crawl spaces that are not maintained at a minimum monthly mean temperature of 64° F (18°C).

**Exceptions:**

1. No foundation not so protected may be attached to frost-protected shallow foundations.
2. Unheated garages, porches, utility rooms and carports shall not be permitted to be attached to dwelling units with frost-protected shallow foundations.

Materials used below grade for the purpose of insulating footings against frost shall be labeled as complying with ASTM C 578.

**R403.3.1 Foundations adjoining frost protected shallow foundations.** Foundations that adjoin frost protected shallow foundations shall be protected from frost in accordance with Section R403.1.4.

- **R403.3.1.1 Attachment to unheated slab-on-ground structure.** Vertical wall insulation and horizontal
insulation of frost protected shallow foundations that adjoin a slab-on-ground foundation that does not have a monthly mean temperature maintained at a minimum of 64°F (18°C), shall be in accordance with Figure R403.3(3) and Table R403.3. Vertical wall insulation shall extend between the frost protected shallow foundation and the adjoining slab foundation. Required horizontal insulation shall be continuous under the adjoining slab foundation and through any foundation walls adjoining the frost protected shallow foundation. Where insulation passes through a foundation wall, it shall either be of a type complying with this section and having bearing capacity equal to or greater than the structural loads imposed by the building, or the building shall be designed and constructed using beams, lintels, cantilevers or other means of transferring building loads such that the structural loads of the building do not bear on the insulation.

R403.3.1.2 Attachment to heated structure. Where a frost protected shallow foundation abuts a structure that has a monthly mean temperature maintained at a minimum of 64°F (18°C), horizontal insulation and vertical wall insulation shall not be required between the frost protected shallow foundation and the adjoining structure. Where the frost protected shallow foundation abuts the heated structure, the horizontal insulation and vertical wall insulation shall extend along the adjoining foundation in accordance with Figure R403.3(4) a distance not of not less than Dimension A in Table R403.3.

Exception: Where the frost protected shallow foundation abuts the heated structure to form an inside corner, vertical insulation extending along the adjoining foundation is not required.

Add new Figures R403.3(3) R403.3(4):
For SI: 1 inch = 25.4 mm

a. See Table R403.3 for required dimensions and R-values for vertical and horizontal insulation.

FIGURE R403.3(3)
INSULATION PLACEMENT FOR FROST-PROTECTED FOOTINGS ADJACENT TO UNHEATED SLAB-ON-GROUND STRUCTURE
Proponent’s Reason:

Overview
Two exceptions to Section 403.3 prohibit attaching FPSF additions to homes with deep foundations and attachment of homes with FPSFs to garages with deep foundations. These exceptions cripple the technology, since most homes have attached garages, and since in many climates deep foundations for unheated spaces are less costly than FPSFs. Moreover, hundreds of such attachments have been built in the U.S. (and thousands in Scandinavia) with no known problem. Millions of buildings in the U.S. have deep foundations attached to much shallower foundations, including walk-out basements, split level homes, and slab additions to buildings with basements. In response to these inconsistencies, NAHB met with the original proponents of the exceptions. Working with them, NAHB Research Center, and experienced FPSF builders, we developed the following requirements. The method for attaching additions mirrors the method used by the U.S. Army CRREL in attachment of an airport addition on a FPSF to a control tower with a 13-foot deep foundation in Alaska.

At the 2001 spring hearings, there was no opposition to this code change from the proponents of the 403.3 exceptions. One of the proponents, in fact, spoke in support of our proposal.

Detailed Description of New Requirements:

New requirements clarify how to attach Frost Protected Shallow Foundations (FPSFs) to other structures, heated and unheated.

Section R403.3 Frost Protected Shallow Foundations: New language clarifies that FPSF designs for heated buildings are not to be used for unheated spaces. It also prohibits the attachment of additions with FPSF to basements or crawl spaces that are not heated, because, although unlikely, in very cold climates frost could penetrate under FPSFs from unheated basements or ventilated crawl spaces. Exception 1, which prohibits FPSFs from being attached to foundations other than FPSFs, and Exception 2, which prohibits unheated garages, etc. from being attached to dwelling units with FPSFs, are deleted. New Sections are added to explain how these attachments are to be made. Differential settlement between attached shallow foundations and deep foundations on low-rise buildings is not a problem where both are on soil with adequate bearing strength. Moreover, both FPSFs and deep foundations that extend below the frost line or to solid rock prevent buildings from moving upward due to frost action.

New Section R403.3.1, Foundations adjoining frost protected shallow foundations, requires that foundations that adjoin FPSFs be protected from frost according to the current requirements of the code in Section R403.1.4. This section requires that foundations extend below the frost line, be built on solid rock, or use FPSF designs. Each method prevents frost from heaving foundations. This language prevents the attachment of FPSFs to reinforced floating garage foundations, which may be permitted by some local codes to be placed at shallow depths without insulating for frost protection (i.e., the foundation moves up and down with frost).

New Section R403.3.1.1, Attachment to unheated slab-on-ground, requires that a house with a FPSF be insulated to current FPSF requirements even where an unheated garage or other slab-on-ground is attached to it. The vertical and horizontal insulation...
must be in accordance with new Figure 403.3(3) and Table R403.3
and be continuous through the foundation of the unheated structure. The vertical wall insulation must extend between the FPSF and the adjoining slab foundation, and any required horizontal insulation must be continuous through any foundation walls adjoining the FPSF. No frost penetration or differential movement occurred with this construction in the HUD demonstration in Fargo, North Dakota (see www.huduser.org/publications/destech/frostprt.html). HUD descriptions of Frost-Protected Shallow Foundations in Residential Construction Phase I and Phase II studies.) Deep foundations of unheated garages have been attached to hundreds of other homes built on FPSFs in the U.S. In most cases the FPSF insulation has been placed continuously between the garage floor and the house FPSF; however, the insulation has not been continuous through the foundation walls of the unheated structures. In these homes no differential movement between the deep and shallow foundations has been reported. The HUD research is supported by extensive research in Scandinavia over the past 45 years, and construction of well over a million FPSFs in Scandinavia, as well as an estimated 3,000 in the United States.

New language at the end of the section addresses last year’s testimony, which stated that change does not provide complete prescriptive details of what must be done, especially concerning the structural connection between the FPSF house and attached garage with the deep foundation. The new language requires that insulation passing through a foundation wall must comply with the requirements of the section, i.e., meet ASTM C 578 and the requirements of Table R403.3, and that the insulation is of a type that has sufficient compressive strength to carry the load of the building. Alternatively, the building must be designed to carry those loads over the insulation and not bear on it.

New Section R403.3.1.2, Attachment to heated structure, states that additions built on FPSFs are not required to be insulated where they join a heated structure because heat from both structures keeps the ground from freezing. However, where the FPSF abuts the heated building, the horizontal and vertical insulation are required to extend along the adjoining foundation, to prevent cold from intruding under the slab through the foundation wall. The dimension of the insulation is related to the width of the horizontal insulation. This technique was shown to be effective by the U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL) on a FPSF addition to an airport control tower with a deep foundation in a severe Alaskan climate with a 13-foot frost line. See the CRREL case study, with illustrations and photographs, Shallow Insulated Foundation at Galena, Alaska, March 1997, at: http://www.crrel.usace.army.mil/techpub/CRREL_Reports/reports/SR 97_07.pdf. An exception is where the abutment is at an inside corner. In this condition, both the building and the addition heat the ground, and extra insulation is not needed.

New Figure R403.3(3). This insulation detail shows the maximum vertical distance between the top of the FPSF and the top of the garage slab, and the minimum vertical distance from the top of the slab and the bottom of the insulation. The horizontal insulation plan shows placement of a FPSF where it meets an unheated garage.

New Figure R403.3(4). This plan shows where extra insulation is required when a FPSF meets a heated structure.

Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.
Assembly Action: Disapproved

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

RB102-02
R506.2.3

Proposed Change as Submitted:

Proponent: Rick Davidson, representing the City of Hopkins, MN

Revise as follows:

R506.2.3 Vapor retarder. An approved vapor retarder with joints lapped not less than 6 inches (152 mm) shall be placed between the concrete floor slab and the base course or the prepared subgrade where no base course exists.

Exception: The vapor retarder may be omitted:

1. From detached garages, utility buildings and other unheated accessory structures.
2. From driveways, walks, patios and other flatwork not likely to be enclosed and heated at a later date.
3. Where approved by the building official, based on local site conditions.

Proponent’s Reason: There is no reason why attached garages should be required to have vapor retarders when detached garages are exempt. Attached garages are no more likely to be heated than detached garages. Even if they are heated, they don’t have showers, cooking, plants, etc., adding to moisture in the air, are constructed so as to be much less airtight than a dwelling, and have large overhead doors that are opened frequently to ventilate the space. Floors are more likely to be constructed above water tables.

Committee Action: Approved as Submitted
Committee Reason: Based on proponent’s published reason.
Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Roger Robertson, Chesterfield County, VA, representing the Virginia Building and Code Officials Association, requests Disapproved.
RB107-02
R602.8 (IBC 716.2.1, IBC 716.2.2)

Proposed Change as Submitted:

Proponent: Al Godwin, CBO, City of Fort Worth, TX

This proposal is on the agenda of the IRC Building/energy and the IBC Fire Safety Code Development Committees. See the tentative hearing orders for these Committees.

Revise as follows:

1. IRC R602.8 (Supp) Fireblocking required.

Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations:

   1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:
      a. Vertically at the ceiling and floor levels.
      b. Horizontally Concealed horizontal furred spaces shall also be fireblocked at intervals not exceeding 10 feet (3048).

   2. IBC 716.2.1 Fireblocking materials.

Fireblocking shall consist of 2-inch (51 mm) nominal lumber or two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints or one thickness of 0.719-inch (18.3 mm) wood structural panel with joints backed by 0.719-inch (18.3 mm) wood structural panel or one thickness of 0.75 inch (19 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard. Gypsum board, cement fiber board, batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fire block. Batt or blankets of mineral or glass fiber or other approved non-rigid materials shall be permitted for compliance with the 10 foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

(2 through 6 unchanged)

R602.8.1 Materials. Except as provided in R602.8, Item 4, fireblocking shall consist of 2-inch (51 mm) nominal lumber, or two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints, or one thickness of 23/32-inch (19.8 mm) wood structural panels with joints backed by 23/32-inch (19.8 mm) wood structural panels or one thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard, ⅝-inch (12.7 mm) gypsum board, or 1/4-inch (6.4 mm) cement-based millboard. Batt or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fire block. Batt or blankets of mineral or glass fiber or other approved non-rigid materials shall be permitted for compliance with the 10 foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs. Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

2. IBC 716.2.2 (Supp) Concealed wall spaces.

Fireblocking shall be provided in concealed spaces of stud walls and partitions, including furred spaces; and parallel rows of studs or staggered studs, as follows:

   a. Vertically at the ceiling and floor levels
   b. Concealed horizontal furred spaces shall also be fireblocked Horizontally at intervals not exceeding 10 feet (3048 mm).

Proponent’s Reason: Code change 82-00 removed the requirement for fireblocking at 10 foot vertical distances. This essentially eliminated the in-between block in two-story entryway construction for residential. In doing so, the remaining wording for horizontal separation only dealt with furred spaces. It was not clear on how to handle parallel framing.

Also, the permitted usage of batts or blankets for parallel framing should be in the material section, and this permitted provision does not appear in the IBC.

Therefore, without changing the original intent of 82-00, this revised wording is proposed to clarify horizontal fireblocking for parallel framing, move the material provision to the material section, and install the batt provision for parallel framing in the IBC.

ITEM 1 (IRC)

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion
ITEM 2 (IBC)  
Committee Action: Approved as Modified

Modify proposal as follows:

716.2.1 Fireblocking required. Fireblocking shall consist of 2-inch (51 mm) nominal lumber or two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints or one thickness of 0.719-inch (18.3 mm) wood structural panel with joints backed by 0.719-inch (18.3 mm) wood structural panel or one thickness of 0.75 inch (19 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard. Gypsum board, cement fiber board, batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fire block. Batt or blankets of mineral or glass fiber or other approved non-rigid materials shall be permitted for compliance with the 10-foot horizontal fireblocking in Section 716.2.2(b) in walls constructed using parallel rows of studs or staggered studs. Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases. The integrity of fire blocks shall be maintained.

IBC 716.2.2 (Supp) Concealed wall spaces. Fireblocking shall be provided in concealed spaces of stud walls and partitions, including furred spaces, and parallel rows of studs or staggered studs, as follows:

a. Vertically In a horizontal orientation at the ceiling and floor levels.

b. Horizontally In a vertical orientation at intervals not exceeding 10 feet (3048 mm).

Committee Reason: Based on published reason. The modification addresses a concern that the terms "vertically" and "horizontally" are unclear as to whether it is a measurement (i.e. horizontal measurement) or installation (i.e. horizontal installation). The proposed modification clarifies that it is the orientation of the fire blocking which is being regulated.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

Public Comment:

Rick Thornberry, PE, The Code Consortium, Inc., requests Approved as Modified by this comment.

Modify proposal as follows:

Revise Items 1.a. and 1.b. of Section R602.8 (Supp) as follows: (in addition to proponents revisions)

R602.8 (Supp) Fireblocking required.

1.a. Vertically In a horizontal orientation at the ceiling and floor levels.

1.b. Horizontally In a vertical orientation at intervals not exceeding 10 feet (3048 mm) measured horizontally.

Commenter's Reason: The purpose of this Public Comment is to have Item 1 of this code change Approved as Modified in accordance with this Public Comment to make it consistent with the action taken by the IBC Fire Safety Code Development Committee on Item 2 of this code change. That Committee approved Item 2 as modified in accordance with the provisions proposed in this Public Comment. Not only will these revisions achieve consistency between the IBC and IRC, they will also clarify how fire blocking is to be provided in concealed spaces of stud walls and partitions. Therefore, we request the voting membership vote to Approve as Modified this code change in accordance with this Public Comment.
Suggested Scoping Modification of Item 1 for coordination with committee modification of Item 2. See page vi for procedural details.

IRC R602.8 (Supp) Fireblocking required. Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:
   a. Vertically In a horizontal orientation at the ceiling and floor levels
   b. Horizontally In a vertical orientation at intervals not exceeding 10 feet (3048 mm).

R602.8.1 Materials. Except as provided in R602.8, Item 4, fireblocking shall consist of 2-inch (51 mm) nominal lumber, or two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints, or one thickness of 23/32-inch (19.8 mm) wood structural panels with joints backed by 23/32-inch (19.8 mm) wood structural panels or one thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard, 5/8-inch (12.7 mm) gypsum board, or 3/4-inch (6.4 mm) cement-based millboard. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fire block. Batts or blankets of mineral or glass fiber or other approved non-rigid materials shall be permitted for compliance with the 10 foot horizontal fireblocking in Section R602.8(1)(b) in walls constructed using parallel rows of studs or staggered studs. Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

Analysis: The following combinations of actions would achieve technical consistency between the IBC and the IRC:

<table>
<thead>
<tr>
<th>Item 1</th>
<th>Item 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>AS</td>
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<tr>
<td>or</td>
<td>or</td>
</tr>
<tr>
<td>Item 1 AM</td>
<td>Item 2 AM</td>
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<tr>
<td>or</td>
<td>or</td>
</tr>
<tr>
<td>Item 1 D</td>
<td>Item 2 D</td>
</tr>
</tbody>
</table>

Walls constructed in accordance with the provisions of this section shall be limited to buildings subjected to a maximum design wind speed of 130 (215 km/h), a maximum ground snow load of 70 psf (3.35 kN/m²), and Seismic Design Categories A, B, C, D₁, and D₂. The provisions of this section shall not apply to the construction of insulating concrete form walls for buildings or portions of buildings considered irregular as defined in Section R301.2.2.7 and R301.2.2.9.

R611.3 Flat insulating concrete form wall systems. Flat ICF wall systems shall comply with Figure R611.3 and shall have reinforcement in accordance with Tables R611.3(1) and R611.3(2) and R611.7.

R611.4 Waffle-grid insulating concrete form wall systems. Waffle-grid wall systems shall comply with Figure R611.4 and shall have reinforcement in accordance with Tables R611.3(1) and R611.4(1) and R611.7. The minimum core dimensions shall comply with Table R611.4(2).

R611.5 Screen-grid insulating concrete form wall systems. Screen-grid ICF wall systems shall comply with Figure R611.5 and shall have reinforcement in accordance with Tables R611.3(1) and R611.5 and Section R611.7. The minimum core dimensions shall comply with Table R611.4(2).

Add new Table R611.3(1) as follows:

---

**Proposed Change as Submitted:**

**Proponent:** Stephen V. Skalko, PE, Portland Cement Association

**Revise as follows:**

**R611.2 Applicability limits.** The provisions of this section shall apply to the construction of insulating concrete form walls for buildings not greater than 60 feet (18 288 mm) in plan dimensions, and floors not greater than 32 feet (9754 mm) or roofs not greater than 40 feet (12 192 mm) in clear span. Buildings shall not exceed two stories in height above-grade with each story not greater than 10 feet (3048 mm) high.
### TABLE R611.3(1)

**DESIGN WIND PRESSURE FOR USE WITH TABLES R611.3(2), R611.4(1), AND R611.5 FOR ABOVE GRADE WALLS**

<table>
<thead>
<tr>
<th>Wind Speed (mph)</th>
<th>Enclosed Exposure B</th>
<th>Enclosed Exposure C</th>
<th>Enclosed Exposure D</th>
<th>Partially Enclosed Exposure B</th>
<th>Partially Enclosed Exposure C</th>
<th>Partially Enclosed Exposure D</th>
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</thead>
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<td>114</td>
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</table>

For SI: 1 psf = 0.0479 kN/m²; 1 mph = 1.6093 km/hr

- **a.** This table is based on ASCE 7-98 components and cladding wind pressures using a mean roof height of 35 ft (10.7 m) and a tributary area of 10 ft² (0.9 m²).
- **b.** Buildings in wind borne debris regions as defined in Section R202 shall be considered as "Partially Enclosed" unless glazed openings are protected in accordance with Section R301.2.2.2 whereby the building shall be considered as "Enclosed". All other buildings shall be classified as "Enclosed".
- **c.** Exposure Categories shall be determined in accordance with Section R301.2.1.4.
- **d.** For wind pressures greater than 80 psf (3.8 kN/m²), design is required in accordance with ACI 318 and approved manufacturer guidelines.
- **e.** Interpolation is permitted between wind speeds.

Delete existing Table R611.3 (Supp) and substitute with new Table R611.3(2) as follows:
<table>
<thead>
<tr>
<th>Design Wind Pressure (Table R611.3(1)) (psf)</th>
<th>Maximum Unsupported Wall Height (feet)</th>
<th>Non-Load Bearing Wall or Supporting Roof</th>
<th>Supporting Light-Frame Second Story and Roof</th>
<th>Supporting ICF Second Story and Roof</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Minimum Wall Thickness (inches)</td>
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</table>

For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 mph = 1.6093 km/hr

a. This table is based on reinforcing bars with a minimum yield strength of 40,000 psi (276 MPa) and concrete with a minimum specified compressive strength of 2,500 psi (17.2 MPa). For Seismic Design Category D, reinforcing bars shall have a minimum yield strength of 60,000 psi (414 MPa). See Section R611.6.2
b. Deflection criterion is L/240, where L is the height of the wall story in inches.
c. Interpolation shall not be permitted.
d. Reinforcement spacing for 3.5 inch (88.9 mm) walls shall be permitted to be multiplied by 1.6 when reinforcing steel with a minimum yield strength of 60,000 psi (414 MPa) is used. Reinforcement shall not be less than one #4 bar at 48 inches (1.2 m) on center.
e. Reinforcement spacing for 5.5 inch (139.7 mm) walls shall be permitted to be multiplied by 1.5 when reinforcing steel with a minimum yield strength of 60,000 psi (414 MPa) is used. Reinforcement shall not be less than one #4 bar at 48 inches (1.2 m) on center.
f. See Section R611.7.1.2 for limitations on maximum spacing of vertical reinforcement in Seismic Design Categories C, D, and D1.
TABLE R611.4(1)
MINIMUM VERTICAL WALL REINFORCEMENT
FOR WAFFLE-GRID ICF ABOVE-GRADE WALLS

<table>
<thead>
<tr>
<th>Design Wind Pressure (Table R611.3(1) (psf))</th>
<th>Maximum Unsupported Wall Height (feet)</th>
<th>Minimum Vertical Reinforcement d, e</th>
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<td>Non-Load Bearing Wall or Supporting Roof</td>
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<td>Minimum Wall Thickness (inches)</td>
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</table>

For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 mph = 1.6093 km/hr

a. This table is based on reinforcing bars with a minimum yield strength of 40,000 psi (276 MPa) and concrete with a minimum specified compressive strength of 2,500 psi (17.2 MPa). For Seismic Design Category D, reinforcing bars shall have a minimum yield strength of 60,000 psi (414 MPa). See Section R611.6.2

b. Deflection criterion is $L/240$, where $L$ is the height of the wall story in inches.

c. Interpolation shall not be permitted.

d. Reinforcement spacing shall be permitted to be increased by 12 inches (305 mm) when reinforcing steel with a minimum yield strength of 60,000 psi (414 MPa) is used or No. 4 reinforcing bars shall be permitted to be substituted for No. 5 bars when reinforcing steel with a minimum yield strength of 60,000 psi (414 MPa) is used at the same spacing required for No. 5 bars. Reinforcement shall not be less than one #4 bar at 48 inches (1.2 m) on center.

e. See Section R611.7.1.2 for limitations on maximum spacing of vertical reinforcement in Seismic Design Categories C, D, and D₂.
Delete Table R611.5 (Supp) and substitute with new Table R611.5 as follows:

<table>
<thead>
<tr>
<th>Design Wind Pressure (psf)</th>
<th>Maximum Unsupported Wall Height (feet)</th>
<th>Minimum Vertical Reinforcement&lt;sup&gt;d,e&lt;/sup&gt;</th>
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</tbody>
</table>

For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 mph = 1.6093 km/hr

- This table is based on reinforcing bars with a minimum yield strength of 40,000 psi (276 MPa) and concrete with a minimum specified compressive strength of 2,500 psi (17.2 MPa). For Seismic Design Category D, reinforcing bars shall have a minimum yield strength of 60,000 psi (414 MPa). See Section R611.6.2
- Deflection criterion is \( L/240 \), where \( L \) is the maximum unsupported height of the wall in inches.
- Interpolation shall not be permitted.
- Reinforcement spacing shall be permitted to be increased by 12 inches (305 mm) when reinforcing steel with a minimum yield strength of 60,000 psi (414 MPa) is used. Reinforcement shall not be less than one #4 bar at 48 inches (1.2 m) on center.
- See Section R611.7.1.2 for limitations on maximum spacing of vertical reinforcement in Seismic Design Categories C, D<sub>1</sub>, and D<sub>2</sub>.

Revise text as follows:

**R611.6.1 Concrete material.** Ready-mixed concrete for insulating concrete form walls shall be in accordance with Section R402.2. Maximum slump shall not be greater than 6 inches (152 mm) as determined in accordance with ASTM C 143. Maximum aggregate size shall not be larger than 3/4 inch (19.1 mm).

**Exception:** Concrete mixes conforming to the ICF manufacturer's recommendations.

In Seismic Design Categories D<sub>1</sub> and D<sub>2</sub>, the minimum concrete compressive strength shall be 3,000 psi (20.5 MPa).

**R611.6.2 Reinforcing steel.** Reinforcing steel shall meet the requirements of ASTM A 615, A 616, A 617, A 706 or A 996. **Except in Seismic Design Categories D<sub>1</sub> and D<sub>2</sub>, the minimum yield strength of reinforcing steel shall be 40,000 psi (Grade 40) (276 MPa). In Seismic Design Categories D<sub>1</sub> and D<sub>2</sub>, reinforcing steel shall meet the requirements of ASTM A 706 for low-alloy steel with a minimum yield strength of 60,000 psi (Grade 60) (414 MPa).**

**R611.7.1.2 Vertical steel.** Above-grade concrete walls shall have reinforcement in accordance with Sections R611.3, R611.4, or R611.5 and R611.7.2. All vertical reinforcement in the top-most ICF story shall terminate with a bend or a standard hook and be provided with a minimum lap splice of 24 inches (610 mm) with the top horizontal reinforcement.

For townhouses in Seismic Design Category C, the minimum vertical reinforcement shall be one No. 5 at 24 inches (610 m) on center or one No. 4 at 16 inches (407 mm) on center. For all buildings in Seismic
Design Categories D<sub>1</sub> and D<sub>2</sub>, the minimum vertical reinforcement shall be one No. 5 at 18 inches (457 mm) on center or one No. 4 at 12 inches (305 mm) on center.

R611.7.1.3 Horizontal steel. Concrete walls with minimum thickness of 4 inches (102 mm) shall have a minimum of one continuous No. 4 horizontal reinforcing bar placed at 32 inches (812 mm) on center with one bar within 12 inches (305 mm) of the top of the wall story. Concrete walls 5.5 inches (140 mm) thick or greater shall have a minimum of one continuous No. 4 horizontal reinforcing bar placed at 48 inches (1219 mm) on center with one bar located within 12 inches (305 mm) of the top of the wall story.

For townhouses in Seismic Design Category C, the minimum horizontal reinforcement shall be one No. 5 at 24 inches (610 mm) on center or one No. 4 at 16 inches (407 mm) on center.

Horizontal reinforcement shall be continuous around building corners using corner bars or by bending the bars. In either case, the minimum lap splice shall be 24 inches (610 mm).

R611.7.4 Minimum length of wall without openings. Exterior ICF walls shall have a minimum of solid wall length to total wall length in accordance with Table R611.7(8), but not less than 15 percent for ICF walls supporting a light framed roof or 20 percent for ICF walls supporting an ICF or light framed second story and light framed roof. For attached dwellings in Seismic Design Category C, the minimum percentage of solid wall length shall be greater than or equal to the requirements in Table R611.7(9). The wind velocity pressures of Table R611.7(8) shall be used to determine the minimum amount of solid wall length in accordance with Tables R611.7(9A) through R611.7(10B) and Figure R611.7(6). Table R611.7(11) shall be used to determine the minimum amount of solid wall length for townhouses in Seismic Design Category C, and all buildings in Seismic Design Categories D<sub>1</sub> and D<sub>2</sub> for all types of ICF walls. The greater amount of solid wall length required by wind loading or seismic loading shall apply. The minimum percentage of solid wall length shall include only those solid wall segments that are a minimum of 24 inches (610 mm) in length. The maximum distance between wall segments included in determining solid wall length shall not exceed 18 feet (5486 mm). A minimum length of 24 inches (610 mm) of solid wall segment, extending the full height of each wall story, shall occur at all interior and exterior corners of exterior walls.

For Seismic Design Categories D<sub>1</sub> and D<sub>2</sub>, the amount of solid wall length shall include only those solid wall segments that are a minimum of 48 inches (1220 mm) in length. The minimum nominal wall thickness shall be 5.5 inches (140 mm) for all wall types.

Add new table as follows:

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<thead>
<tr>
<th>Wind Speed (mph)</th>
<th>Velocity Pressure (psf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure B</td>
<td>C</td>
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</table>

For SI: 1 psf = 0.0479 kN/m²; 1 mph = 1.6093 km/hr

a. Table values are based on ASCE 7-98 Figure 6-4 using a mean roof height of 35 ft (10.7 m).
b. Exposure Categories shall be determined in accordance with Section R301.2.1.4.
c. Design is required in accordance with ACI 318 and approved manufacturer guidelines.
d. Interpolation is permitted between wind speeds.

Delete existing Table R611.7(8) and substitute with Tables R611.7(9A), R611.7(9B), R611.7(10A) and R611.7(10B) as follows:

(underlining omitted for clarity)
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<tr>
<th>Wall Category</th>
<th>Building Side Wall Length, L (feet)</th>
<th>Wind Velocity Pressure from Table R611.7(8) (psf)</th>
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<td>8.75 10.0 11.5 12.75 14.0 15.5 16.75 19.5</td>
</tr>
</tbody>
</table>
For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 psf = 0.0479 kN/m²

a. Table values are based on a 3.5 in (88.9 mm) thick flat wall. For a 5.5 in (139.7 mm) thick flat wall, multiply the table values by 0.9. The adjusted values shall not result in solid wall lengths less than 4ft.
b. Table values are based on a maximum unsupported wall height of 10 ft (3.0 m).
c. Linear interpolation shall be permitted.
d. The minimum solid wall lengths shown in the table are based on a building with an end wall length “W” of 60 feet and a roof slope of less than 7:12. For roof slopes of 7:12 or greater and end wall length “W” greater than 30 feet, the minimum solid wall length determined from the table shall be multiplied by:

\[1 + 0.4\frac{(W-30)}{30}\]

### TABLE R611.7(9B)
MINIMUM SOLID SIDEWALL LENGTH
REQUIREMENTS FOR FLAT ICF WALLS
(WIND PARALLEL TO RIDGE)\(^a\), \(^b\), \(^c\), \(^d\)

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<tr>
<th>Wall Category</th>
<th>Building End Wall Width, W (feet)</th>
<th>Wind Velocity Pressure from Table R611.7(8) (psf)</th>
<th>Minimum Solid Wall Length on Building Side Wall (feet)</th>
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For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 psf = 0.0479 kN/m²

a. Table values are based on a 3.5 in (88.9 mm) thick flat wall. For a 5.5 in (139.7 mm) thick flat wall, multiply the table values by 0.9. The adjusted values shall not result in solid wall lengths less than 4ft.
b. Table values are based on a maximum unsupported wall height of 10 ft (3.0 m).
c. Table values are based on a maximum 12:12 roof pitch.
d. Linear interpolation shall be permitted.
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<th>Wind Velocity Pressure from Table R611.7(8)</th>
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For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 psf = 0.0479 kN/m²

a. Table values are based on a 6 in (152.4 mm) thick nominal waffle-grid wall. For a 8 in (203.2 mm) thick nominal waffle-grid wall, multiply the table values by 0.90.
b. Table values are based on a maximum unsupported wall height of 10 ft (3.0 m).
c. Linear interpolation is permitted.
d. The minimum solid wall lengths shown in the table are based on a building with an end wall length "W" of 60 feet and a roof slope of less than 7:12. For roof slopes of 7:12 or greater and end wall length "W" greater than 30 feet, the minimum solid wall length determined from the table shall be multiplied by: 1 + 0.4(W-30)/30
**TABLE R611.7(10B)**

**MINIMUM SOLID SIDE WALL LENGTH**

**REQUIREMENTS for 6-INCH WAFFLE AND SCREEN-GRID ICF WALLS**

*(WIND PARALLEL TO RIDGE)*

**a,b,c,d**

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<th>Building End Wall Width, W (feet)</th>
<th>Wind Velocity Pressure from Table R611.7(8) (psf)</th>
<th>Minimum Solid Wall Length on Building Side Wall (feet)</th>
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<td>4.00</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>4.00</td>
<td>4.25</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>4.50</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>5.25</td>
<td>6.00</td>
</tr>
<tr>
<td></td>
<td>50</td>
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</tr>
<tr>
<td></td>
<td>60</td>
<td>7.75</td>
<td>8.75</td>
</tr>
<tr>
<td>First Story of Two-Story</td>
<td>16</td>
<td>4.50</td>
<td>4.75</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>5.00</td>
<td>5.75</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>6.00</td>
<td>6.75</td>
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<tr>
<td></td>
<td>40</td>
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<td>8.00</td>
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<td>8.50</td>
<td>9.75</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>10.25</td>
<td>12.0</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 psf = 0.0479 kN/m²

a. Table values are based on a 6 in (152.4 mm) thick nominal waffle-grid wall. For a 8 in (203.2 mm) thick nominal waffle-grid wall, multiply the table values by 0.90.

b. Table values are based on a maximum unsupported wall height of 10 ft (3.0 m).

c. Table values are based on a maximum 12:12 roof pitch.

d. Linear interpolation shall be permitted.

Delete Table R611.7(9) and substitute with Table R611.7(11) as follows:

**TABLE R611.7(11)**

**MINIMUM PERCENTAGE OF SOLID WALL LENGTH ALONG EXTERIOR WALL LINES FOR TOWNHOUSES IN SEISMIC DESIGN CATEGORY C AND ALL BUILDINGS IN SEISMIC DESIGN CATEGORY D**

<table>
<thead>
<tr>
<th>Seismic Design Category (SDC)</th>
<th>Minimum Solid Wall Length (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One-Story or Top Story of Two-Story</td>
</tr>
<tr>
<td>Townhouses in SDC C</td>
<td>20 percent</td>
</tr>
<tr>
<td>D</td>
<td>25 percent</td>
</tr>
<tr>
<td>D_2</td>
<td>30 percent</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm; 1 mph = 1.6093 km/hr

a. Base percentages are applicable for maximum unsupported wall height of 10-feet (3.0-m), light-frame gable construction, and all ICF wall types.

b. For all walls, the minimum required length of solid walls shall be based on the table percent value multiplied by the minimum dimension of a rectangle inscribing the overall building plan.

c. Walls shall be reinforced with a minimum No. 5 bar (Grade 40 or 60) spaced a maximum of 24 inches (609.6 mm) on center each way or a No. 4 bar spaced a maximum of 16 inches on center each way.

d. Walls shall be constructed with a minimum concrete compressive strength of 3,000 psi (20.7 MPa) and reinforced with minimum #5 rebar (Grade 60 ASTM A706) spaced a maximum of 18 inches (457.2 mm) on center each way or No. 4 rebar (Grade 60 ASTM A706) spaced at a maximum of 12 inches (304.8 mm) on center each way. The minimum thickness of flat ICF walls shall be 5.5 inches.

Add new Figure R611.7(6) as follows:
Delete existing section R611.7.1.4 (Supp) as follows:

R611.7.1.4 (Supp) Dwellings in Seismic Design Category C. Townhouses in Seismic Design Category C shall have horizontal and vertical reinforcement in accordance with the following:

1. Vertical reinforcement consisting of at least one No. 4 reinforcing bar, extending continuously from support to support, shall be provided at each corner, at each side of each opening, and at the ends of walls.

2. Horizontal reinforcement consisting of at least one No. 4 reinforcing bar, continuously at structurally connected roof and floor levels and at the top of the wall, at the bottom of load-bearing walls or in the top of foundations where doweled to the wall and at a maximum spacing of 10 feet (3048 mm).

Vertical reinforcement provided in accordance with Sections R611.7.1.2 and R611.7.2, and horizontal reinforcement provided in accordance with R611.7.1.3
and §RR611.7.3, shall be permitted to be used to meet the requirements of this section.

Add new Section R611.8.1 as follows:

R611.8.1.1 Top Bearing Requirements for Seismic Design Categories C, D₁, and D₂. For townhouses in Seismic Design Category C, wood sill plates attached to ICF walls shall be anchored with ASTM A307, Grade A, 3/8-inch (9.5 mm) diameter headed anchor bolts embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 36 inches (914 mm) on center. For all buildings in Seismic Design Category D₁, wood sill plates attached to ICF walls shall be anchored with ASTM A307, Grade A, 3/8-inch (9.5 mm) diameter headed anchor bolts embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 24 inches (610 mm) on center. For all buildings in Seismic Design Category D₂, wood sill plates attached to ICF walls shall be anchored with ASTM A307, Grade A, 3/8-inch (9.5 mm) diameter headed anchor bolts embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 16 inches (406 mm) on center. Larger diameter bolts than specified herein shall not be used.

For townhouses in Seismic Design Category C, each floor joist shall be attached to the sill plate with an 18-gauge angle bracket using 3 – 8d common nails per leg in accordance with Figure R611.8(1). For all buildings in Seismic Design Category D₁, each floor joist shall be attached to the sill plate with an 18-gauge angle bracket using 4 – 8d common nails per leg in accordance with Figure R611.8(1). For all buildings in Seismic Design Category D₂, each floor joist shall be attached to the sill plate with an 18-gauge angle bracket using 6 – 8d common nails per leg in accordance with Figure R611.8(1).

Revise text as follows:

R611.8.2.1 Ledger bearing requirements for Seismic Design Categories C, D₁, and D₂. In Seismic Design Category C, additional anchorage mechanisms connecting the wall to the floor system shall be installed at a maximum spacing of 6 feet (1829 mm) on center for townhouses in Seismic Design Category C and 4 feet (1220 mm) on center for all buildings Seismic Design Categories D₁ and D₂. The additional anchorage mechanisms shall be attached to the ICF wall and joist, rafters, or blocking in accordance with Figures R611.8(1) through R611.8(6). The additional anchorage shall be installed through an oversized hole in the ledger board that is 1/2 in (12.7 mm) larger than the anchorage mechanism diameter to prevent combined tension and shear in the mechanism. The blocking shall be attached to floor or roof sheathing in accordance with edge fastener spacing. Such additional anchorage shall not be accomplished by the use of toe nails or nails subject to withdrawal nor shall such anchorage mechanisms shall not induce tension stresses perpendicular to grain in ledgers or nails. The capacity of such anchors shall result in providing the additional anchorage required by this section.

Where the additional anchorage mechanism consist of ASTM A307, Grade A headed bolts, the design tensile strengths shown in Table R611.9 shall be equal to or greater than the product of the design values listed in Table R611.8 and the spacing of the bolts in feet. Anchor bolts shall be embedded a minimum of 3 inches, except bolts installed in 3.5 inch flat ICF walls shall be embedded not less than 2 inches. Bolts with hooks shall not be used.

**TABLE R611.9**

<table>
<thead>
<tr>
<th>Diameter of Bolt (inches)</th>
<th>Design Tensile Strength (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>1150</td>
</tr>
<tr>
<td>3/8</td>
<td>2810</td>
</tr>
<tr>
<td>1/2</td>
<td>5110</td>
</tr>
</tbody>
</table>

a. ASTM A307, Grade A headed bolts
b. Applicable to concrete of all strengths

Insert new Table R611.8 as follows:

**TABLE R611.8**

<table>
<thead>
<tr>
<th>Wall Type</th>
<th>Seismic Design Category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C</td>
</tr>
<tr>
<td>Flat 3.5</td>
<td>193</td>
</tr>
<tr>
<td>Flat 5.5</td>
<td>303</td>
</tr>
<tr>
<td>Flat 7.5</td>
<td>413</td>
</tr>
<tr>
<td>Flat 9.5</td>
<td>523</td>
</tr>
<tr>
<td>Waffle 6</td>
<td>246</td>
</tr>
<tr>
<td>Waffle 8</td>
<td>334</td>
</tr>
<tr>
<td>Screen 6</td>
<td>233</td>
</tr>
</tbody>
</table>

For SI: 1plf = 14.59 N/m

a. Table values are based on IBC Equation 16- 64 using a tributary wall height of 11 feet (3353 mm). Table values shall be permitted to be reduced for tributary wall heights less than 11 feet (3353 mm) by multiplying the table values by X/11, where X is the tributary wall height.
b. Values may be reduced by 30 percent when used for ASD design.

Revise text as follows:
R611.8.3 Floor and roof diaphragm construction.
Floor and roof diaphragms shall be constructed of structural wood sheathing panels, attached to wood framing in accordance with Table R602.3(1) or Table R602.3(2) or to cold-formed steel floor framing in accordance with Table R505.3.1(2) or to cold-formed steel roof framing in accordance with Table R804.3. Additionally, sheathing panel edges perpendicular to framing members shall be backed by blocking and sheathing shall be connected to the blocking with fasteners at the edge spacing. For Seismic Design Category C, where the width to thickness dimension of the diaphragm exceeds 2 to 1, edge spacing of fasteners shall be 4 inches (102 mm) on center.

Add new text as follows:

R611.8.3.1 Floor and roof diaphragm construction requirements in Seismic Design Categories D₁ and D₂. The requirements of this section shall apply in addition to those required by Section R611.8.3. Edge spacing of fasteners in floor and roof sheathing shall be 4 inches (102 mm) on center for Seismic Design Category D₁ and 3 inches (76 mm) on center for Seismic Design Category D₂. In Seismic Design Categories D₁ and D₂, all sheathing edges shall be attached to framing or blocking. Minimum sheathing fastener size shall be 0.113 inch (2.8 mm) diameter with a minimum penetration of 1-3/8 inches (35 mm) into framing members supporting the sheathing. Minimum wood structural panel thickness shall be 7/16 inch (11 mm) for roof sheathing and 23/32 inch (18 mm) for floor sheathing.

Add new text as follows:

R611.9.1 ICF wall to top sill plate (roof) connection for Seismic Design Categories C, D₁, and D₂. The requirements of this section shall apply in addition to those required by Section R611.9. For townhouses in Seismic Design Category C, wood sill plates attaching roof framing to ICF walls shall be anchored with ASTM A307, Grade A, 3/8 inch (9.5 mm) diameter headed anchor bolt embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 36 inches (914 mm) on center in accordance with Figure R611.9. Wood sill plates attaching roof framing to ICF walls shall be anchored with ASTM A307, Grade A, 3/8 inch (9.5 mm) diameter headed anchor bolt embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 24 inches (609 mm) on center in accordance with Figure R611.9. Larger diameter bolts than specified herein shall not be used.
FIGURE R611.8(1)
SECTION CUT THROUGH FLAT WALL OR VERTICAL CORE
OF WAFFLE- OR SCREEN-GRID WALL
FIGURE R611.8(2)
FLOOR LEDGER - ICF WALL CONNECTION
(SIDE BEARING CONNECTION)
FIGURE R611.8(3)
FLOOR LEDGER - ICF WALL CONNECTION
(LEDSGE BEARING CONNECTION)
FIGURE R611.8(4)
FLOOR LEDGER - ICF WALL CONNECTION
(THROUGH-BOLT SIDE BEARING CONNECTION)
FIGURE R611.8(5)
FLOOR LEDGER - ICF WALL CONNECTION
(THROUGH BOLT LEDGE BEARING CONNECTION)
Clip Angle at Each Roof Framing Member in Seismic Design Categories C, D, and D  
Per Section R611.9.1

Light-Frame Roof

Sill Plate
Anchor Bolt (See Section R611.9)
ICF Wall
Minimum No. 4 Bar (Continuous)
Vertical Wall Reinforcement as Required

FIGURE R611.9
ROOF SILL PLATE - ICF WALL CONNECTION
R301.2.2.7 Irregular buildings. Concrete construction complying with Section R611 or R612 and G conventional light-frame construction shall not be used in irregular portions of structures in Seismic Design Categories C, D1, and D2. Only such irregular portions of structures shall be designed in accordance with accepted engineering practice to the extent such irregular features affect the performance of the conventional framing system. A portion of a building shall be considered to be irregular when one or more of the following conditions occur:

(No change to remainder of section)

Revise text as follows:

R301.2.2.8 Concrete construction in Seismic Design Categories D1 and D2. Buildings with above-grade concrete walls in Seismic Design Categories D1 and D2 shall be in accordance with Section R611, R612, or R611.2 designed in accordance with accepted engineering practice.

Propponent’s Reason:

R611.2: These proposed changes provide a necessary link to the irregularity limitations given in Chapter 3 and to expand the applicability limits for wind and seismic conditions in coordination with the remainder of this proposal.

R611.3: The proposed method allows for more accurate selection of wall reinforcement based on wind speed, building site exposure, and building enclosure. The values are calculated in accordance with ASCE 7-98.

R611.4: The proposed method allows for more accurate selection of wall reinforcement based on wind speed, building site exposure, and building enclosure. The values are calculated in accordance with ASCE 7-98.

R611.5: The proposed method allows for more accurate selection of wall reinforcement based on wind speed, building site exposure, and building enclosure. The values are calculated in accordance with ASCE 7-98.

T. R611.3(1): This will coordinate with the previous portions of this proposal for determining design wind pressures and related reinforcement requirements for ICF construction.

T. R611.3(2): This coordinates with the previous portions of this proposal for determining design wind pressures and provides coordination with new table numbering.

T. R611.4(1): This coordinates with the previous portions of this proposal for determining design wind pressures and new table numbering.

T. R611.5: This coordinates with the previous portions of this proposal for determining design wind pressures and new table numbering.

R611.6.1: This proposal requires an increased concrete compressive strength for Seismic Design Categories D1 and D2 as required in the IBC and ACI 318.

R611.6.2: This proposal places the requirements for reinforcement in high seismic conditions per ACI 318. In addition, it revises the combining of ASTM standards A 616 and A 617 into A 996.

R611.7.1.2: This proposal requires an increased vertical reinforcing for Seismic Design Categories C, D1, and D2 in accordance with the IBC and ACI 318 seismic design requirements for special reinforced concrete walls.

R611.7.1.3: Increased horizontal reinforcing for Seismic Design Categories C, D1, and D2 in accordance with the IBC and ACI 318 seismic design requirements are provided.

R611.7.4: The proposal allows for more flexibility for the code user in that a building site exposure can be chosen in addition to the wind speed. It also provides for wind speeds up to 150 mph and Seismic Design Categories D1 and D2. Table formatting has also been improved to give more flexibility and design accuracy with regards to the geometry of the building, and the effects of wind and seismic loads to be resisted.

T. R611.7(8): This coordinates with previous portions of this proposal for determining velocity pressures based on use of ASCE 7-98 to determine lateral building loads due to wind.

T. R611.7(9A): This proposal coordinates with the previous proposals for determining velocity pressures.

T. R611.7(11) This proposal coordinates with the previous portions of this proposal to include Seismic Design Category D1 and D2 in the code.

F. R611.7(6) Coordinates with previous proposal for determining velocity pressures and solid wall requirements. The figure provides a graphical representation method used in determining the minimum solid wall length requirements.

R611.7.1.4: Provides redundant information.

R611.8.1.1 The purpose of this proposal is to address top bearing requirements associated with expanding provisions to include Seismic Design Categories D1 and D2.

R611.8.2.1 This provides connection detailing requirements for out-of-plane seismic forces consistent with IBC design requirements and variation in out-of-plane loads due to different ICF wall thicknesses and types.

T. R611.8 Provides connection load requirements for out-of-plane seismic forces consistent with IBC seismic provisions (Section 1620). A factor of 0.8 is used with Equation 16-64 rather than 1.2 to comply with an interim amendment to the IBC in previous cycles.

R611.8.3 The first change is to include a reference for alternate attachment of wood structural panels provided by Table R602.3(2). The second change deletes the special nailing requirements for dwellings in Seismic Design Category C. A review of the diaphragm nailing requirements based on IBC seismic loads (Section 1620), IBC unit shear values for diaphragms (Table 2306.3.1), worst case above grade wall mass (8 inch waffle-grid), and worst case allowable building diaphragm aspect ratio of 2:1 show the existing Tables R602.3(1) and R602.3(2) can provide the necessary connections.

R611.8.3.1 The purpose of this proposal is to address diaphragm strength requirements associated with expanding provisions to include Seismic Design Categories D1 and D2. Diaphragm nailing requirements are based on IBC seismic loads (Section 1620), IBC unit shear values for diaphragms (Table 2306.3.1), worst case above grade wall mass (8 inch waffle-grid), and worst case allowable building diaphragm aspect ratio of 2:1.

R611.9.1 This proposal places requirements for attachment of the top plate to the ICF wall in Seismic Design Categories, C, D1, and D2. These requirements are based on IBC seismic loads (Section 1620), IBC unit shear values for diaphragms (Table 2306.3.1), worst case above grade wall mass (8 inch waffle-grid), and worst case allowable building diaphragm aspect ratio of 2:1.

F. R611.8(1): To coordinate the figures with the previous portions of this proposal.

R301.2.2.7 The above change is necessary to recognize the existence of ICF construction in the IRC and currently

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permitted in Seismic Design Category C. This oversight was recognized in the development of ICF seismic provisions for Seismic Design Categories D1 and D2 that are presented under additional proposals in this package.

R301.2.2.8 This change is in coordination with the remaining proposals to introduce provisions for concrete above-grade wall construction (Section 611) in Seismic Design Categories D1 and D2.

Committee Action: Approved as Modified

Modify proposal as follows:

PROPOSED MODIFICATIONS TO RB122-02

1. Revise the applicability limits as follows (Page RB93):

R611.2 Applicability Limits. The provisions of this section shall apply to the construction of insulating concrete form walls for building not greater than 60 feet (18 288 mm) in plan dimensions, and floors not greater than 32 feet (9754 mm) or roofs not greater than 40 feet (12 192 mm) in clear span. Buildings shall not exceed two stories in height above-grade with each story not greater than 10 feet (3048 mm) high. Insulating concrete form walls shall comply with the requirements in Table R611.2(2). Walls constructed in accordance with the provisions of this section shall be limited to buildings subjected to a maximum design wind speed of 150 miles per hour (241 km/h), a maximum ground snow load of 70 psf (3.35 kN/m²), and Seismic Design Categories A, B, C, D1, and D2. The provisions of this section shall not apply to the construction of insulating concrete form walls for buildings or portions of buildings considered irregular as defined in Section R301.2.2.7 and R301.2.2.9.

For townhouses in Seismic Design Category C and all buildings in Seismic Design Category D, the provisions of this section shall only apply to buildings meeting the following requirements:

1. Rectangular buildings with a maximum building aspect ratio of 2:1. The building aspect ratio shall be determined by dividing the longest dimension of the building by the shortest dimension of the building.

2. Walls are aligned vertically with the walls below.

3. Cantilever and setback construction shall not be permitted.

4. Brick veneer shall not be applied as an exterior wall finish material for townhouses in Seismic Design Category C and all buildings in Seismic Design Categories D1 and D2.
2. Revise and renumber Table R611.4 (2) by deleting any reference to Waffle and Screen Grid ICF walls and add maximum wall weights as shown in the shaded areas. The new table number will be Table R611.2.

<table>
<thead>
<tr>
<th>WALL TYPE AND NOMINAL SIZE</th>
<th>MAXIMUM WALL WEIGHT (psf)</th>
<th>MINIMUM WIDTH OF VERTICAL CORE (inches)</th>
<th>MINIMUM THICKNESS OF VERTICAL CORE, (inches)</th>
<th>MAXIMUM SPACING OF VERTICAL CORES (inches)</th>
<th>MAXIMUM SPACING OF HORIZONTAL CORES (inches)</th>
<th>MINIMUM WEB THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.5&quot; Flat</td>
<td>44</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>6.5&quot; Flat</td>
<td>69</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5.5&quot; Flat</td>
<td>94</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>4.5&quot; Flat</td>
<td>119</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>6&quot; Waffle-Grid</td>
<td>56</td>
<td>6.25</td>
<td>5</td>
<td>12</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>8&quot; Waffle-Grid</td>
<td>76</td>
<td>7</td>
<td>7</td>
<td>12</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>6&quot; Screen-Grid</td>
<td>53</td>
<td>5.5</td>
<td>5</td>
<td>12</td>
<td>12</td>
<td>N/A</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm

a. For width “W,” thickness “T,” spacing, and web thickness, refer to Figures R611.4 and R611.5.
b. N/A indicates not applicable
c. Wall weight is based on a unit weight of concrete of 150 psf (23.6 kN/m²). The tabulated values include an 8 psf (0.38 kN/m²) allowance for interior and exterior finishes.

3. Revise R611.7.1.2 further by adding the additional language and adding a new section for a standard hooks as follows (Page RB97):

R611.7.1.2 Vertical steel. Above-grade concrete walls shall have reinforcement in accordance with Sections R611.3, R611.4, or R611.5 and R611.7.2. All vertical reinforcement in the top-most ICF story shall terminate with a bend or standard hook and be provided with a minimum lap splice of 24 inches (610 mm) with the top horizontal reinforcement.

For townhouses in Seismic Design Category C, the minimum vertical reinforcement shall be one No. 5 at 24 inches (610 mm) on center or one No. 4 at 16 inches (407 mm) on center. For all buildings in Seismic Design Categories D1 and D2, the minimum vertical reinforcement shall be one No. 5 at 18 inches (457 mm) on center or one No. 4 at 12 inches (305 mm) on center.

Above-grade ICF walls shall be supported on concrete foundations reinforced as required for the above-grade wall immediately above, or in accordance with Tables R404.4(1) through R404.4(5), whichever requires the greater amount of reinforcement.

Vertical reinforcement shall be continuous from the bottom of the foundation wall to the roof. Lap splices, if required, shall comply with R611.7.1.5. Where vertical reinforcement in the above-grade wall is not continuous with the foundation wall reinforcement, dowel bars with a size and spacing to match the vertical ICF wall reinforcement shall be embedded 40d into the foundation wall and shall be lapspliced with the above-grade wall reinforcement. Alternatively, for No. 6 and larger bars, the portion of the bar embedded in the foundation wall shall be embedded 24 inches in the foundation wall and shall have a standard hook.

R611.7.1.6 Standard hook. Where the free end of a reinforcing bar is required to have a standard hook, the hook shall be a 180-degree bend plus 4d extension but not less than 2-1/2 inches, or a 90-degree bend plus 12d, extension.

4. Revise R611.7.1.3 further as follows (Page RB 98):

R611.7.1.3 Horizontal steel. Concrete walls with a minimum thickness of 4 inches (102 mm) shall have a minimum of one continuous No. 4 horizontal reinforcing bar placed at 32 inches (812 mm) on center with one bar within 12 inches (305 mm) of the top of the wall story. Concrete walls 5.5 inches (140 mm) thick or greater shall have a minimum of one continuous No. 4 horizontal reinforcing bar placed at 48 inches (1219 mm) on center with one bar located with in 12 inches (305 mm) of the top of the wall story.

For townhouses in Seismic Design Category C, the minimum horizontal reinforcement shall be one No. 5 at 24 inches (610 mm) on center or one No. 4 at 16 inches (407 mm) on center. For all buildings in Seismic Design Categories D1 and D2, the minimum horizontal reinforcement shall be one No. 5 at 18 inches (457 mm) on center or one No. 4 at 12 inches (305 mm) on center.

Horizontal reinforcement shall be continuous around building corners using corner bars or by bending the bars. In either case, the minimum lap splice shall be 24 inches (610 mm). For townhouses in Seismic Design Category C and for all buildings in Seismic Design Categories D1 and D2, each end of all horizontal reinforcement shall terminate with a standard hook or lap splice.

5. Revise new R611.8.1.1 as follows (Page RB 105):

R611.8.1.1 Top Bearing Requirements for Seismic Design Categories C, D1, and D2. For townhouses in Seismic Design Category C, wood sill plates attached to ICF walls shall be anchored with Grade A 307, 5/8-inch (9.5 mm) diameter anchor bolts embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 36 inches (914 mm) on center. For all ... (no change)... For all buildings in Seismic Design Category D2, wood sill plates attached to ICF walls shall be anchored with Grade A 307, 5/8-inch (9.5 mm) diameter anchor bolts embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 16 inches (406 mm) on center.

For townhouses in Seismic Design Category C, each floor joist perpendicular to an ICF wall shall be attached to the sill plate with an 18-gauge angle bracket using 3 - 8d common nails per leg in accordance with Figure R611.8(1). For all buildings in Seismic Design Category D1, each floor joist perpendicular to an ICF wall...
shall be attached to the sill plate with an 18-gauge angle bracket with
using 4 - 8d common nails per leg in accordance with Figure R611.8(1).
For all buildings in Seismic Design Category D₂, each floor joist
perpendicular to an ICF wall shall be attached to the sill plate with an
18-gauge angle bracket with using 6 - 8d common nails per leg in
accordance with Figure R611.8(1).

For ICF walls parallel to floor framing in townhouses in Seismic Design
Category C, full depth blocking shall be placed at 24 inches (610 mm) on
center and shall be attached to the sill plate with an 18-gauge angle
bracket using 5 - 8d common nails per leg in accordance with Figure
R611.8(6). For ICF walls parallel to floor framing in all buildings in
Seismic Design Category D₁, full depth blocking shall be placed at 24
inches (610 mm) on center and shall be attached to the sill plate with an
18-gauge angle bracket using 6 - 8d common nails per leg in
accordance with Figure R611.8(6). For ICF walls parallel to floor framing
for all buildings in Seismic Design Category D₂, full depth blocking shall be
placed at 24 inches (610 mm) on center and shall be attached to the sill
plate with an 18-gauge angle bracket with using 9 - 8d common nails per
leg in accordance with Figure R611.8(6).

6. Revise R611.8.2.1 further as follows (Page RB 105):

R611.8.2.1 Ledger bearing requirements for Seismic Design
Categories C, D₁ and D₂. Additional anchorage mechanisms connecting
the wall to floor system shall be installed at a maximum spacing of 6 feet
(1829 mm) on center for townhouses in Seismic Design Category C and 4
feet (1220 mm) on center for all buildings Seismic Design Categories D₁
and D₂. The additional anchorage mechanisms shall be attached to the
ICF wall reinforcement and joist, rafters, or blocking in accordance with
Figures R611.8(1) through R611.8(7). The blocking shall be... (no change
to remainder of proposal for this section.).

Where the additional anchorage mechanisms consist of threaded rods
with hex nuts or headed bolts complying with ASTM A307, Grade A or
ASTM F1554, Grade 36 headed bolts, the design tensile strengths shown
in Table R611.9 shall be equal to or greater than the product of the design
values listed in Table R611.8 and the spacing of the bolts in feet. Anchor
bolts shall be installed a minimum 3 inches, except bolts installed in 3.5
inch flat ICF walls shall be embedded not less than 2 inches as indicated
in Table R611.9. Bolts with hooks shall not be used.

7. Revise Table R611.9 as follows (Page RB 105):

<table>
<thead>
<tr>
<th>Diameter of Bolt inches</th>
<th>Design Tensile Strength (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>1150</td>
</tr>
<tr>
<td>3/8 with washer</td>
<td>2810</td>
</tr>
<tr>
<td>1/2</td>
<td>5110</td>
</tr>
</tbody>
</table>

a. Values are base on ASTM F1554, Grade 36 bolts or threaded rods.
Where ASTM A307, Grade A headed bolts are used, the strength
shall be increased by 1.034.
b. Applicable to concrete of all strengths. Embedment depth shall be
permitted to be reduced 1/4 inch where 3,000 psi concrete is used
and by 1/2 inch where 4000 psi concrete is used.
c. A hardened washer shall be installed at the nut embedded in the
concrete or head of the bolt to increase the bearing area. The washer
need not be installed where the concrete strength is 4,000 psi or
greater.

8. Revise R611.8.2.1 as follows (Page 105):

R611.8.2.1 Ledger bearing requirements for Seismic Design
Categories C, D₁ and D₂. Additional anchorage mechanisms connecting
the wall to floor system shall be installed at a maximum spacing of 6 feet
(1829 mm) on center for townhouses in Seismic Design Category C
and 4 feet (1220 mm) on center for all buildings Seismic Design
Categories D₁ and D₂. The additional anchorage mechanisms shall be
attached to the ICF wall reinforcement and joist, rafters, or
blocking in accordance with Figures R611.8(1) through R611.8(6).
The additional anchorage shall be installed through an oversized
hole in the ledger board that is 1/2 in (12.7 mm) larger than the
anchorage mechanism diameter to prevent combined tension and
shear in the mechanism. The blocking shall be attached to floor or
roof sheathing in accordance with edge fastener spacing. Such
additional anchorage shall not be accomplished by the use of toe
nails or nails subject to withdrawal nor shall such anchorage
mechanisms induce tension stresses perpendicular to grain in
ledgers or nailers. The capacity of such anchors shall result in
connections capable of resisting the design values listed in Table
R611.8. The diaphragm sheathing fasteners applied directly to a
ledger shall not be considered effective in providing the additional
anchorage required by this section.
9. Further revise by adding new Figures R611.8(6) and R611.8(7).

FIGURE R611.8.6
ANCHORAGE REQUIREMENTS FOR TOWNHOUSES IN SEISMIC DESIGN CATEGORY C AND ALL BUILDINGS IN SEISMIC DESIGN CATEGORY D FOR FLOOR FRAMING PARALLEL TO WALL
FIGURE R611.8(7)
ANCHORAGE REQUIREMENTS FOR TOWNHOUSES IN SEISMIC DESIGN CATEGORY C AND ALL BUILDINGS IN SEISMIC DESIGN CATEGORY D FOR FLOOR FRAMING PARALLEL TO WALL
10. Revise R611.8.3.1 further as follows (Page 106).

R611.8.3.1 Floor and roof diaphragm construction requirements in Seismic Design Categories D1 and D2. The requirements of this section shall apply in addition to those required by Section R611.8.3. Edge spacing of fasteners in floor and roof sheathing shall be 4 inches (102 mm) on center for Seismic Design Category D1, and 3 inches (76 mm) on center for Seismic Design Category D2. All sheathing edges shall be attached to framing or blocking. Minimum sheathing fastener size shall be 0.113 inch (2.8 mm) diameter with a minimum penetration of 1-3/8 inches (35 mm) into framing members supporting the sheathing. Minimum wood structural panel thickness shall be 7/16 inch (11 mm) for roof sheathing and 23/32 inch (18 mm) for floor sheathing. Vertical offsets in floor framing shall not be permitted.

11. Replace proposed R611.9.1 with the following (page 106):

R611.9.1 ICF wall to top sill plate (roof) connection for Seismic Design Categories C, D1, and D2. The requirements of this section shall apply in addition to those required by Section R611.9. The top of an ICF wall at a gable shall be attached to an attic floor in accordance with Section R611.8.1.1. For townhouses in Seismic Design Category C attic floor diaphragms shall be constructed of structural wood sheathing panels, attached to wood framing in accordance with Table R602.3(1) or Table R602.3(2). Edge spacing of fasteners in attic floor sheathing shall be 4 inches (102 mm) on center for Seismic Design Category D1 and 3 inches (76 mm) on center for Seismic Design Category D2. In Seismic Design Categories D1 and D2, all sheathing edges shall be attached to framing or blocking. Minimum sheathing fastener size shall be 0.113 inch (2.8 mm) diameter with a minimum penetration of 1-3/8 inches (35 mm) into framing members supporting the sheathing. Minimum wood structural panel thickness shall be 7/16 inch (11 mm) for the attic floor sheathing. Where hipped roof construction is used, the use of a structural attic floor is not required.

For townhouses in Seismic Design Category C, wood sill plates attached to ICF walls shall be anchored with Grade A307, 3/8-inch (9.5 mm) diameter anchor bolts embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 36 inches (914 mm) on center. For all buildings in Seismic Design Category D2, wood sill plates attached to ICF walls shall be anchored with Grade A307, 3/8-inch (9.5 mm) diameter anchor bolts embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 24 inches (610 mm) on center. For all buildings in Seismic Design Category D2, wood sill plates attached to ICF walls shall be anchored with Grade A307, 3/8-inch (9.5 mm) diameter anchor bolts embedded a minimum of 7 inches (178 mm) and placed at a maximum spacing of 16 inches (406 mm) on center.

For townhouses in Seismic Design Category C, each floor joist shall be attached to the sill plate with an 18-gauge angle bracket using 3 - 8d common nails per leg in accordance with Figure R611.8(1). For all buildings in Seismic Design Category D1, each floor joist shall be attached to the sill plate with an 18-gauge angle bracket with using 4 - 8d common nails per leg in accordance with Figure R611.8(1). For all buildings in Seismic Design Category D2, each floor joist shall be attached to the sill plate with an 18-gauge angle bracket with using 6 - 8d common nails per leg in accordance with Figure R611.8(1).

Where hipped roof construction is used without an attic floor, the following shall apply. For townhouses in Seismic Design Category C, each rafter shall be attached to the sill plate with an 18-gauge angle bracket using 3 - 8d common nails per leg in accordance with Figure R611.9. For all buildings in Seismic Design Category D1, each rafter shall be attached to the sill plate with an 18-gauge angle bracket with using 4 - 8d common nails per leg in accordance with Figure R611.9. For all buildings in Seismic Design Category D2, each rafter shall be attached to the sill plate with an 18-gauge angle bracket with using 6 - 8d common nails per leg in accordance with Figure R611.9.
12. Add the following footnote (g) to Table R611.9.1:

<table>
<thead>
<tr>
<th>DESIGN WIND PRESSURE</th>
<th>MAXIMUM WALL HEIGHT</th>
<th>MINIMUM VERTICAL REINFORCEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE R611.3(1)</td>
<td>WALL (feet)</td>
<td>NON-LOAD BEARING WALL OR SUPPORTING ROOF</td>
</tr>
<tr>
<td>(psf)</td>
<td></td>
<td>3.5&quot;</td>
</tr>
<tr>
<td>FOR FLAT ICF ABOVE-Grade WALLS*&lt;sup&gt;a,b,c&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(NO CHANGE TO TABULAR VALUES)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 mph = 1.6093 km/hr

**g.** A 3.5-inch wall shall not be permitted if wood ledgers are used to support floor or roof loads. See Section R611.8.

**Committee Reason:** Based on proponent’s published reason. The modifications were made to address concerns raised by the Building Seismic Safety Council, about the high seismic requirements.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Stephen V. Skalko, PE, Portland Cement Association, requests Approved as Modified by this comment.

**Modify proposal as follows:**

1. **Revise R611.2 as follows:**

R611.2 Applicability Limits. The provisions of this section shall apply to the construction of insulating concrete form walls for building not greater than 60 feet (18 288 mm) in plan dimensions, and floors not greater than 32 feet (9754 mm) or roofs not greater than 40 feet (12 192 mm) in clear span. Buildings shall not exceed two stories in height above-grade. Insulating concrete form walls shall comply with the requirements in Table R611.2(2). Walls constructed in accordance with the provisions of this section shall be limited to buildings subjected to a maximum design wind speed of 150 miles per hour (241 km/h), a maximum ground snow load of 70 psf (3.35 kN/m<sup>2</sup>), and Seismic Design Categories A, B, C, D<sub>1</sub>, and D<sub>2</sub>. The provisions of this section shall not apply to the construction of insulating concrete form walls for buildings or portions of buildings considered irregular as defined in Section R301.2.2.7 and R301.2.2.9.

For townhouses in Seismic Design Category C and all buildings in Seismic Design Category D, the provisions of this section shall only apply to buildings meeting the following requirements.

1. Rectangular buildings with a maximum building aspect ratio of 2:1. The building aspect ratio shall be determined by dividing the longest dimension of the building by the shortest dimension of the building.
2. Walls are aligned vertically with the walls below.
3. Cantilever and setback construction shall not be permitted.

4. Brick veneer shall not be applied as an exterior wall finish material for townhouses in Seismic Design Category C and all buildings in Seismic Design Categories D<sub>1</sub> and D<sub>2</sub>. The weight of interior and exterior finishes applied to ICF walls shall not exceed 8 psf (0.38 kN/m<sup>2</sup>).

5. The gable portion of ICF walls shall be constructed of light-frame construction.
2. Further modify Table R611.2, Footnote (c).

<table>
<thead>
<tr>
<th>Wall Type and Nominal Size</th>
<th>Maximum wall weight (psf)</th>
<th>Minimum Width of Vertical Core (inches)</th>
<th>Minimum Thickness of Vertical Core, (inches)</th>
<th>Maximum Spacing of Vertical Cores (inches)</th>
<th>Maximum Spacing of Horizontal Cores (inches)</th>
<th>Minimum Web Thickness (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5&quot; Flat</td>
<td>44</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5.5&quot; Flat</td>
<td>69</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>7.5&quot; Flat</td>
<td>94</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>9.5&quot; Flat</td>
<td>119</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>6&quot; Waffle-Grid</td>
<td>56</td>
<td>6.25</td>
<td>5</td>
<td>12</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>8&quot; Waffle-Grid</td>
<td>76</td>
<td>7</td>
<td>7</td>
<td>12</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>6&quot; Screen-Grid</td>
<td>53</td>
<td>5.5</td>
<td>5.5</td>
<td>12</td>
<td>12</td>
<td>N/A</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm

a For width "W", thickness "T", spacing, and web thickness, refer to Figures R611.4 and R611.5.

b N/A indicates not applicable

c Wall weight is based on a unit weight of concrete of 150 pcf (23.6kN/m²). The tabulated values do not include any allowance for interior and exterior finishes.

3. Replace existing Table R611.7(1) with the following:

<table>
<thead>
<tr>
<th>Wall Type and Opening Width, L feet (m)</th>
<th>Minimum Horizontal Opening Reinforcement</th>
<th>Minimum Vertical Opening Reinforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat, Waffle-, and Screen-Grid: L &lt; 2 (0.61)</td>
<td>None Required</td>
<td>None Required</td>
</tr>
<tr>
<td>Flat, Waffle-, and Screen-Grid: L ≥ 2 (0.61)</td>
<td>Provide lintels in accordance with Section R611.7.3. Provide one No. 4 bar within 12 inches (305 mm) from the bottom of the opening. Top and bottom lintel reinforcement shall extend a minimum of 24 inches (610 mm) beyond the limits of the opening.</td>
<td>In locations with wind speeds less than or equal to 110 mph (177 km/hr) or in Seismic Design Categories A and B, provide one No. 4 bar for the full height of the wall story within 12 inches (305 mm) of each side of the opening. In locations with wind speeds greater than 110 mph (177 km/hr), townhouses in Seismic Design Category C, or all buildings in Seismic Design Categories D₁ and D₂, provide two No. 4 bars or one No. 5 bar for the full height of the wall story within 12 inches (305 mm) of each side of the opening.</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 mph = 1.6093 km/hr

Note: This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross-section. This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.

4. Revise Table R611.7(11), Footnote (a) as follows. No change to Table values.

* Base percentages are applicable for maximum unsupported wall height of 10-feet (3.0-m), light-frame gable construction, and all ICF wall types. These percentages assume that the maximum weight of the interior and exterior wall finishes applied to ICF walls do not exceed 8 psf (0.38 kN/m²).

5. Revise Section R611.8.2 and R611.8.2.1 as follows:

R611.8.2 Ledger bearing. Wood ledger boards supporting bearing ends of joists or trusses shall be anchored to flat ICF walls with minimum thickness of 3.5 inches (140 mm) in accordance with Figure R611.8(4) or R611.8(5). The ledger shall be a minimum 2 by 8, No. 2 Southern Pine or No. 2 Douglas Fir. Ledgers anchored to nonload-bearing walls to support floor or roof sheathing shall be attached with 1/2 inch (12.7 mm) diameter or headed anchor bolts spaced a maximum of 6 feet (1829 mm) on center. Anchor bolts shall be embedded a minimum of 4 inches (102 mm) into the concrete.

6. Revise Section R611.7.1.5 as follows and add new Figure R611.7(2). Renumber remaining figures:

R611.7.1.5 Lap Splices. Where lap splicing of vertical or horizontal reinforcing steel is necessary, the lap splice shall be in accordance with Figure R611.7 (2) and a minimum of 40dₜ, where dₜ is the diameter of the smaller bar. The maximum distance between noncontact parallel bars at a lap splice shall not exceed 8dₜ.
7. Replace Table R611.9 with a new table as follows.

<table>
<thead>
<tr>
<th>Diameter of Bolt - inches (inches)</th>
<th>Design Tensile Strength (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>¼</td>
<td>4450</td>
</tr>
<tr>
<td>⅜ with washer</td>
<td>2610</td>
</tr>
<tr>
<td>½</td>
<td>5110</td>
</tr>
</tbody>
</table>

a. Values are based on ASTM F1554, Grade 36 bolts or threaded rods. Where ASTM A307, Grade A headed bolts are used, the strength shall be increased by 1.034.

b. Applicable to concrete of all strengths. Embedment depth shall be permitted to be reduced ¼ inch where 3,000 psi concrete is used and, by ½ inch where 4,000 psi concrete is used.

c. A hardened washer shall be installed at the nut embedded in the concrete or head of the bolt to increase the bearing area. The washer need not be installed where the concrete strength is 4,000 psi or greater.

d. Applicable to concrete of all strengths. See Notes (c) and (d)

Table R611.9
DESIGN TENSILE STRENGTH OF HEADED BOLTS CAST IN CONCRETE

<table>
<thead>
<tr>
<th>Diameter of Bolt - inches</th>
<th>Minimum Embedment Depth (in.)</th>
<th>Design Tensile Strength (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>2</td>
<td>1040</td>
</tr>
<tr>
<td>3/8 with washer</td>
<td>2-3/4</td>
<td>2540</td>
</tr>
<tr>
<td>1/2 with washer</td>
<td>4</td>
<td>4630</td>
</tr>
</tbody>
</table>

a. Applicable to concrete of all strengths. See Notes (c) and (d)

b. Values are based on ASTM F1554, Grade 36 bolts. Where ASTM A307, Grade A headed bolts are used, the strength shall be increased by 1.034.

c. A hardened washer shall be installed at the nut embedded in the concrete or head of the bolt to increase the bearing area. The washer need not be installed where the concrete strength is 4,000 psi or greater.

d. Embedment depth shall be permitted to be reduced 1/4-inch where 4000 psi concrete is used.

Commenter’s Reasons:

RB122-02 was approved with several modifications at the hearing in Pittsburgh. As part of that approval, the Portland Cement Association committed to prepare a complete package of the text for Section R611 including the modifications and to circulate the document to interested parties to review for completeness. Based on that review, the attached modifications are proposed to finalize the requirements for ICF walls in the IRC covered by RB 122-02.

1: The design calculations the ICF provisions for townhouses in Seismic Design Category C and all buildings in Seismic Design Category D were based on limiting the weight of interior and exterior finishes to 8 psf. In addition, limitations are placed to only allowing light-framing for gables. This change further clarifies these limitations for ICF walls in higher seismic areas.

2: This modification makes clear the values in Table R611.2 do not include the weight of interior and exterior finishes.

3: Table R611.7(1) was proposed for revision in code change RB123-02. That change was recommended for disapproval because the table contained references to SDC D1 and D2 and proposed change RB122-02, which includes provisions for SDC D had not been acted on by the committee at the time RB123-02 was considered. The table is included here to make the provisions covered by RB122-02 more complete.

4: This makes the provisions in Table R611.7(11) consistent with the limitations in Section R611.2 for ICF walls in higher seismic areas.

5: Code change RB122-02 added an additional table (Table R611.8) for design values of anchorage for floor joists to walls in high seismic areas. This change completes the necessary editorial modifications needed with the additional table. Existing Table R611.8 becomes Table R611.8(1). The table added becomes Table R611.8(2).

6: This completes the ICF provisions by showing the correct application of lap splices covered by Section R611.7.5.

7: The modifications approved in Pittsburgh revised proposed Table R611.9 for anchor bolts to include washers. Additional information is needed for embedment length of the bolts and the design tensile values need to be revised. This proposed replacement Table R611.9 adds the required embedment depths for the headed bolts and revises the design tensile strength of the bolts.

RB123-02
Table R611.7(1)

Proposed Change as Submitted:

Proponent: Stephen V. Skalko, PE, Portland Cement Association

Delete existing Table R611.7(1) and substitute as follows:
TABLE R611.7(1)  
MINIMUM WALL OPENING REINFORCEMENT REQUIREMENTS IN ICF WALLS

<table>
<thead>
<tr>
<th>Wall Type and Opening Width, L Feet (m)</th>
<th>Minimum Horizontal Opening Reinforcement</th>
<th>Minimum Vertical Opening Reinforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat, Waffle-, and Screen-Grid:</td>
<td>None Required</td>
<td>None Required</td>
</tr>
<tr>
<td>L &lt; 2 (0.61)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat, Waffle-, and Screen-Grid:</td>
<td>Provide lintels in accordance with</td>
<td>In locations with wind speeds less</td>
</tr>
<tr>
<td>L ≥ 2 (0.61)</td>
<td>Section R611.7.3. Provide one No. 4</td>
<td>than or equal to 110 mph (177 km/hr)</td>
</tr>
<tr>
<td></td>
<td>bar within 12 inches (305 mm) from the</td>
<td>or in Seismic Design Categories A and</td>
</tr>
<tr>
<td></td>
<td>bottom of the opening. Top and bottom</td>
<td>B, provide one No. 4 bar for the full</td>
</tr>
<tr>
<td></td>
<td>lintel reinforcement shall extend a</td>
<td>height of the wall story within 12</td>
</tr>
<tr>
<td></td>
<td>minimum of 24 inches (610 mm) beyond</td>
<td>inches (305 mm) of each side of the</td>
</tr>
<tr>
<td></td>
<td>the limits of the opening.</td>
<td>opening.</td>
</tr>
<tr>
<td></td>
<td>In locations with wind speeds greater</td>
<td>In locations with wind speeds greater</td>
</tr>
<tr>
<td></td>
<td>than 110 mph (177 km/hr), townhouses</td>
<td>than 110 mph (177 km/hr), townhouses</td>
</tr>
<tr>
<td></td>
<td>in Seismic Design Category C, or all</td>
<td>in Seismic Design Category C, or all</td>
</tr>
<tr>
<td></td>
<td>buildings in Seismic Design Categories</td>
<td>buildings in Seismic Design Categories</td>
</tr>
<tr>
<td></td>
<td>D&lt;sub&gt;1&lt;/sub&gt; and D&lt;sub&gt;2&lt;/sub&gt;, provide</td>
<td>D&lt;sub&gt;1&lt;/sub&gt; and D&lt;sub&gt;2&lt;/sub&gt;, provide</td>
</tr>
<tr>
<td></td>
<td>two No. 4 bars or one No. 5 bar for the</td>
<td>two No. 4 bars or one No. 5 bar for</td>
</tr>
<tr>
<td></td>
<td>full height of the wall story within</td>
<td>the full height of the wall story</td>
</tr>
<tr>
<td></td>
<td>12 inches (305 mm) of each side of the</td>
<td>within 12 inches (305 mm) of each side</td>
</tr>
<tr>
<td></td>
<td>opening.</td>
<td>of the opening.</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1 mile per hour = 1.609 km/h.

NOTE: This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.

Revisé as follows:

R611.7.3.1 (Supp) General requirements. Lintels shall be provided over all openings greater than or equal to 4 feet (1219 mm) in width. Lintels for flat ICF walls and screen-grid ICF walls shall be constructed in accordance with Figure R611.7(3) and Table R611.7(2) or R611.7(3). Lintels for waffle-grid ICF walls shall be constructed in accordance with Figure R611.7(4) or Figure R611.7(5) and Table R611.7(4) or R611.7(5). Lintels for screen-grid ICF walls shall be constructed in accordance with Figure R611.7(6) or Figure R611.7(7). Lintel construction in accordance with Figure R611.7(3) shall be permitted to be used with waffle-grid and screen-grid ICF wall construction. Lintel depths are permitted to be increased by the height of the ICF wall located directly above the lintel opening, provided that the lintel depth spans the entire length of the opening.

Add new Figures R611.7(6) and R611.7(7):
FIGURE R611.7(6)
SINGLE FORM HEIGHT SCREEN-GRID LINTEL

FIGURE R611.7(7)
DOUBLE FORM HEIGHT SCREEN-GRID LINTEL
Revise sections R611.7.3.2 and R611.7.3.3 and Tables R611.7(2) - (5) (Supp) and add new Tables R611.7(6) - (8) as follows:

**R611.7.3.2 Stirrups.** A minimum of Where required, No. 3 stirrups shall be installed in for all flat, waffle-grid and screen-grid wall lintels in accordance with the following:

1. For flat walls the stirrups shall be spaced at a maximum spacing of \( \frac{d}{2} \) where \( d \) equals the depth of the lintel (D) minus the bottom cover of concrete as shown in Figure R611.7(3); R611.7(4), or R611.7(5). Stirrups shall not be required in the middle portion of the span (A) per Figure R611.7(2), for flat walls for a length not to exceed the values shown in parenthesis in Tables R611.7(2) and R611.7(3) or for spans in accordance with Table R611.7(8).

2. For waffle-grid walls a minimum of two No. 3 stirrups shall be placed in each vertical core of waffle-grid lintels. Stirrups shall not be required in the middle portion of the span (A) per Figure R611.7(2), for waffle-grid walls for a length not to exceed the values shown in parenthesis in Tables R611.7(4) and R611.7(5) or for spans in accordance with Table R611.7(8).

3. For screen-grid walls one No. 3 stirrup shall be placed in each vertical core of screen-grid lintels.

**Exception:** Stirrups are not required in Screen-grid lintels meeting the following requirements:

- a) Lintel Depth (D) = 12 inches (305 mm)
  - spans less than or equal 3 feet – 7 inches
- b) Lintel Depth (D) = 24 inches (610 mm)
  - spans less than or equal 4 feet – 4 inches

**R611.7.3.3 Horizontal reinforcement.** One No. 4 horizontal bar shall be provided in the top of the lintel. Horizontal reinforcement placed within 12 inches (305 mm) of the top of the wall in accordance with Section R611.7.1.3 shall be permitted to serve as the top or bottom reinforcement in the lintel provided the reinforcement meets the location requirements in Figure R611.7(2), R611.7(3), R611.7(4), or R611.7(5), R611.7(6), or R611.7(7), and the size requirements in Tables R611.7(2), R611.7(3), R611.7(4), R611.7(5), R611.7(6), or R611.7(7), or R611.7(8).
# TABLE R611.7(2) (Supp)
## MAXIMUM ALLOWABLE CLEAR SPANS FOR ICF LINTELS FOR FLAT AND SCREEN-GRID LOAD-BEARING WALLS

### NO. 4 BOTTOM BAR SIZE

<table>
<thead>
<tr>
<th>Minimum Lintel Width, W (inches)</th>
<th>Lintel Depth, D (inches)</th>
<th>Maximum Clear Span, (feet-inches) (Number is Middle of Span, A) ≤</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supporting Light-Framed Roof Only</td>
<td>Supporting Light Framed 2nd Story and Roof</td>
</tr>
<tr>
<td></td>
<td>30 psf</td>
<td>70 psf</td>
</tr>
<tr>
<td>4-3.5</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>4-9</td>
<td>6-8</td>
</tr>
<tr>
<td></td>
<td>(1-2)</td>
<td>(1-1)</td>
</tr>
<tr>
<td></td>
<td>(0-9)</td>
<td>(1-3)</td>
</tr>
<tr>
<td></td>
<td>3-10</td>
<td>5-0</td>
</tr>
<tr>
<td></td>
<td>(0-8)</td>
<td>(1-1)</td>
</tr>
<tr>
<td>5-5.5</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5-2</td>
<td>6-8</td>
</tr>
<tr>
<td></td>
<td>(1-10)</td>
<td>(3-0)</td>
</tr>
<tr>
<td></td>
<td>(1-2)</td>
<td>(2-2)</td>
</tr>
<tr>
<td></td>
<td>(1-0)</td>
<td>(1-9)</td>
</tr>
<tr>
<td></td>
<td>(0-9)</td>
<td>(1-4)</td>
</tr>
<tr>
<td></td>
<td>(0-10)</td>
<td>(1-4)</td>
</tr>
<tr>
<td>6-7.5</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5-2</td>
<td>6-7</td>
</tr>
<tr>
<td></td>
<td>(2-6)</td>
<td>(4-0)</td>
</tr>
<tr>
<td></td>
<td>(1-8)</td>
<td>(2-2)</td>
</tr>
<tr>
<td></td>
<td>(1-5)</td>
<td>(2-4)</td>
</tr>
<tr>
<td></td>
<td>(1-1)</td>
<td>(1-10)</td>
</tr>
<tr>
<td></td>
<td>(0-11)</td>
<td>(1-6)</td>
</tr>
<tr>
<td>8-9.5</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>5-2</td>
<td>6-7</td>
</tr>
<tr>
<td></td>
<td>(3-1)</td>
<td>(5-0)</td>
</tr>
<tr>
<td></td>
<td>(2-1)</td>
<td>(3-4)</td>
</tr>
<tr>
<td></td>
<td>(2-1)</td>
<td>(3-0)</td>
</tr>
<tr>
<td></td>
<td>(1-9)</td>
<td>(1-5)</td>
</tr>
<tr>
<td></td>
<td>(1-5)</td>
<td>(1-5)</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m², 1 psf = 0.0479 kN/m²

a. This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used, the span lengths in the shaded cells shall be increased by 1.2 times the table values.
b. This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.
c. Deflection criteria: L/240.
d. Design load assumptions:
   - Floor dead load is 10 psf
   - Attic live load is 20 psf
   - Floor live load is 30 psf
   - Roof dead load is 15 psf
   - Building width is 32 feet
   - ICF wall dead load is 69 psf
   - Light-framed wall dead load is 10 psf
f. No. 3 stirrups are required at d/2 spacing except no stirrups are required for the distance, (A), shown in the middle portion of the span in accordance with Figure R611.7(2) and Section R611.7.3.2.

Interpolation is permitted between ground snow loads and between lintel depths.
<table>
<thead>
<tr>
<th>Minimum Lintel Width, ( W ) (inches)</th>
<th>Lintel Depth, ( D ) (inches)</th>
<th>Maximum Clear Span, (feet-inches) (Number is Middle of Span, ( A ))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supporting Light-Framed Roof</td>
<td>Supporting Light Framed 2nd Story and Roof</td>
</tr>
<tr>
<td></td>
<td>30 psf</td>
<td>70 psf</td>
</tr>
<tr>
<td>4.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4-9 (1-2)</td>
<td>4-2 (0-9)</td>
</tr>
<tr>
<td>12</td>
<td>7-2 (1-11)</td>
<td>6-3 (1-3)</td>
</tr>
<tr>
<td>16</td>
<td>9-6 (2-9)</td>
<td>8-0 (1-9)</td>
</tr>
<tr>
<td>20</td>
<td>11-1 (3-5)</td>
<td>9-1 (2-3)</td>
</tr>
<tr>
<td>24</td>
<td>12-2 (4-1)</td>
<td>10-0 (2-9)</td>
</tr>
<tr>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>5-6 (1-10)</td>
<td>4-10 (1-2)</td>
</tr>
<tr>
<td>12</td>
<td>8-3 (3-0)</td>
<td>6-9 (2-0)</td>
</tr>
<tr>
<td>16</td>
<td>9-9 (4-1)</td>
<td>8-0 (2-9)</td>
</tr>
<tr>
<td>20</td>
<td>10-11 (5-3)</td>
<td>9-0 (3-6)</td>
</tr>
<tr>
<td>24</td>
<td>12-0 (6-3)</td>
<td>9-11 (4-3)</td>
</tr>
<tr>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>6-1 (2-6)</td>
<td>5-2 (1-8)</td>
</tr>
<tr>
<td>12</td>
<td>8-2 (4-0)</td>
<td>6-9 (2-8)</td>
</tr>
<tr>
<td>16</td>
<td>9-7 (5-5)</td>
<td>7-11 (3-8)</td>
</tr>
<tr>
<td>20</td>
<td>10-10 (6-10)</td>
<td>8-11 (4-8)</td>
</tr>
<tr>
<td>24</td>
<td>11-10 (8-2)</td>
<td>9-10 (5-8)</td>
</tr>
<tr>
<td>9.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>6-4 (3-1)</td>
<td>5-2 (2-1)</td>
</tr>
<tr>
<td>12</td>
<td>8-2 (5-0)</td>
<td>6-8 (3-4)</td>
</tr>
<tr>
<td>16</td>
<td>9-6 (6-9)</td>
<td>7-11 (4-7)</td>
</tr>
<tr>
<td>20</td>
<td>10-8 (8-4)</td>
<td>8-10 (5-10)</td>
</tr>
<tr>
<td>24</td>
<td>11-7 (10-0)</td>
<td>9-9 (6-11)</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m², 1 psf = 0.0479 kN/m²²

a. This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.
b. This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.
c. Deflection criterion: \( L/240 \).
d. Design load assumptions:
   - Floor dead load is 10 psf
   - Attic live load is 20 psf
   - Floor live load is 30 psf
   - Roof dead load is 15 psf

For SI: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m², 1 psf = 0.0479 kN/m²²

a. This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.
b. This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.
c. Deflection criterion: \( L/240 \).
d. Design load assumptions:
   - Floor dead load is 10 psf
   - Attic live load is 20 psf
   - Floor live load is 30 psf
   - Roof dead load is 15 psf
Building width is 32 ft
Light-frame wall dead load is 10 psf
ICF wall dead load is 69 psf

e. No. 3 stirrups are required at \(d/2\) spacing except no stirrups are required for the distance, (A), shown in the middle portion of the span in accordance with Figure R611.7(2) and Section R611.7.3.2.

f. Interpolation is permitted between ground snow loads and between lintel depths.

g. For actual wall lintel width, refer to Table R611.4(2)

h. Lintel width corresponds to the nominal waffle-grid ICF wall thickness with a minimum thickness of 2 inches.

<table>
<thead>
<tr>
<th>Nominal Lintel Width, (W) (^{(a,b)}) (Inches)</th>
<th>Lintel Depth (D) (Inches)</th>
<th>Maximum Clear Span (feet-inches) (Number is Middle of Span, A) (^{(e)})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supporting Light-Framed Roof</td>
<td>Supporting Light Framed 2nd Story and Roof</td>
</tr>
<tr>
<td></td>
<td>Ground Snow Load</td>
<td>Floor dead load is 10 psf</td>
</tr>
<tr>
<td></td>
<td>30 psf</td>
<td>70 psf</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>5-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0-10)</td>
</tr>
<tr>
<td>12</td>
<td>16</td>
<td>7-11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1-11)</td>
</tr>
<tr>
<td>20</td>
<td>24</td>
<td>8-11</td>
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<tr>
<td>24</td>
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<td>9-10</td>
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<td>8</td>
<td>5-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0-10)</td>
</tr>
<tr>
<td>12</td>
<td>16</td>
<td>7-10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1-11)</td>
</tr>
<tr>
<td>20</td>
<td>24</td>
<td>8-10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2-6)</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m², 1 psf = 0.0479 kN/m²

---

**Notes:**

a. This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.

b. This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.

c. Deflection criterion: \(L/240\).

d. Design load assumptions:
   - Floor dead load is 10 psf
   - Attic live load is 20 psf
   - Floor live load is 30 psf
   - Roof dead load is 15 psf
   - Building width is 32 ft
   - ICF wall dead load is 55 psf
   - Light-frame wall dead load is 10 psf

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TABLE R611.7(5) (Supp)
MAXIMUM ALLOWABLE CLEAR SPANS FOR WAFFLE-GRID ICF WALL LINTELS$^{a, b, c, d, e, f}$

#5 Bottom Bar Size

<table>
<thead>
<tr>
<th>Nominal Lintel Width, $W_{g, h}$ (Inches)</th>
<th>Lintel Depth $D$ (Inches)</th>
<th>Maximum Clear Span (feet-inches) (Number is Middle of Span, $A)$$^g$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Supporting Light-Framed Roof</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 psf</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>5-4</td>
</tr>
<tr>
<td>12</td>
<td>(1-5)</td>
<td>6-0</td>
</tr>
<tr>
<td>16</td>
<td>(1-11)</td>
<td>8-0</td>
</tr>
<tr>
<td>20</td>
<td>(2-6)</td>
<td>11-0</td>
</tr>
<tr>
<td>24</td>
<td>(3-0)</td>
<td>12-2</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>6-0</td>
</tr>
<tr>
<td>12</td>
<td>(1-5)</td>
<td>8-3</td>
</tr>
<tr>
<td>16</td>
<td>(1-11)</td>
<td>9-9</td>
</tr>
<tr>
<td>20</td>
<td>(2-6)</td>
<td>10-11</td>
</tr>
<tr>
<td>24</td>
<td>(3-0)</td>
<td>12-0</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m$^2$, 1 psf = 0.0479 kN/m$^2$

- **a.** This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.
- **b.** This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.
- **c.** Deflection criterion: $L/240$.
- **d.** Design load assumptions:
  - Floor dead load is 10 psf
  - Attic live load is 20 psf
  - Floor live load is 30 psf
  - Roof dead load is 15 psf
  - Building width is 32 ft
  - ICF wall dead load is 55 psf
  - Light-frame wall dead load is 10 psf
- **e.** No. 3 stirrups are required at $d/2$ spacing except no stirrups are required for the distance, ($A$), shown in the middle portion of the span in accordance with Figure R611.7(2) and Section R611.7.3.2.
- **f.** Interpolation is permitted between ground snow loads and between lintel depths.
- **g.** For actual wall lintel width, refer to Table R611.4(2).
- **h.** Lintel width corresponds to the nominal waffle-grid ICF wall thickness with a minimum thickness of 2 inches.
### TABLE R611.7(6)
**MAXIMUM ALLOWABLE CLEAR SPANS FOR SCREEN-GRID ICF LINTELS IN LOAD-BEARING WALLS**

**No. 4 Bottom Bar Size**

<table>
<thead>
<tr>
<th>Minimum Lintel Thickness, (T) (inches)</th>
<th>Minimum Lintel Depth, D (inches)</th>
<th>MAXIMUM CLEAR SPAN (feet-inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Supporting Roof</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>3-7</td>
</tr>
<tr>
<td>24</td>
<td>9-10</td>
<td>8-1</td>
</tr>
</tbody>
</table>

**For SI:** 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m², 1 psf = 0.0479 kN/m²

**a.** This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.

**b.** This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.

**c.** Deflection criterion: \[ L/240 \]

**d.** Design load assumptions:
- Floor dead load is 10 psf
- Attic live load is 20 psf
- Floor live load is 30 psf
- Roof dead load is 15 psf
- Maximum floor clear span is 32 ft
- ICF wall dead load is 53 psf
- Light-frame wall dead load is 10 psf

**e.** Stirrup Requirements:
- Stirrups are not required for lintels 12 inches deep.
- One No. 3 stirrup is required in each vertical core for lintels 24 inches deep.

**f.** Interpolation is permitted between ground snow loads.

**g.** Flat ICF lintels may be used in lieu of screen-grid lintels.

**h.** For actual lintel width, refer to Table R611.4(2).

**i.** Lintel width corresponds to the nominal screen-grid ICF wall thickness.
### TABLE R611.7(7)

**MAXIMUM ALLOWABLE CLEAR SPANS FOR SCREEN-GRID ICF LINTELS IN LOAD-BEARING WALLS**

#### No. 5 Bottom Bar Size

<table>
<thead>
<tr>
<th>Minimum Lintel Thickness, (T) (inches)</th>
<th>Minimum Lintel Depth, D (inches)</th>
<th>MAXIMUM CLEAR SPAN (feet-inches)</th>
<th>Supporting Roof</th>
<th>Supporting Light-Frame Second Story and Roof</th>
<th>Supporting ICF Second Story and Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Maximum Ground Snow Load (psf)</td>
<td>30</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>3-7</td>
<td>2-10</td>
<td>2-5</td>
<td>2-0</td>
</tr>
<tr>
<td>6</td>
<td>24</td>
<td>12-3</td>
<td>10-0</td>
<td>9-3</td>
<td>8-3</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m², 1 psf = 0.0479 kN/m²

a. This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.

b. This table is not intended to prohibit the use of ICF manufacturer’s tables based on engineering analysis in accordance with ACI 318.

c. Deflection criterion: L/240

d. Design load assumptions:

- Floor dead load is 10 psf
- Attic live load is 20 psf
- Floor live load is 30 psf
- Roof dead load is 15 psf
- Maximum floor clear span is 32 ft
- ICF wall dead load is 53 psf
- Light-frame wall dead load is 10 psf

- Floor dead load is 10 psf
- Attic live load is 20 psf
- Floor live load is 30 psf
- Roof dead load is 15 psf
- Maximum floor clear span is 32 ft
- ICF wall dead load is 53 psf
- Light-frame wall dead load is 10 psf

e. Stirrup Requirements:

- Stirrups are not required for lintels 12 inches deep.
- One No. 3 stirrup is required in each vertical core for lintels 24 inches deep.

f. Interpolation is permitted between ground snow loads.

g. Flat ICF lintels may be used in lieu of screen-grid lintels.

h. For actual wall lintel width, refer to Table R611.4(2).

i. Lintel width corresponds to the nominal screen-grid ICF wall thickness.

### TABLE R611.7(8)

**MAXIMUM ALLOWABLE CLEAR SPANS FOR ICF LINTELS WITHOUT STIRRUPS IN LOAD-BEARING WALLS**

#### (NO. 4 OR NO. 5 BOTTOM BAR SIZE)

<table>
<thead>
<tr>
<th>Minimum Lintel Thickness, (T) (inches)</th>
<th>Minimum Lintel Depth, D (inches)</th>
<th>MAXIMUM CLEAR SPAN (feet-inches)</th>
<th>Supporting Roof Only</th>
<th>Supporting Light-Frame Second Story and Roof</th>
<th>Supporting ICF Second Story and Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Maximum Ground Snow Load (psf)</td>
<td>30</td>
<td>70</td>
<td>30</td>
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<td>8</td>
<td>2-6</td>
<td>4-2</td>
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<td>3.5</td>
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<td>4-2</td>
<td>4-2</td>
<td>4-1</td>
<td>4-11</td>
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<td>3.5</td>
<td>16</td>
<td>4-11</td>
<td>4-11</td>
<td>4-6</td>
<td>7-7</td>
</tr>
<tr>
<td>3.5</td>
<td>20</td>
<td>6-3</td>
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<td>3.5</td>
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<td>7-7</td>
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<td>6-5</td>
<td>5-1</td>
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<td>4-2</td>
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<tr>
<td>Waffle-Grid ICF Lintel</td>
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<tr>
<td><strong>6 or 8</strong></td>
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<td>2-6</td>
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<td>4-2</td>
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<td>4-1</td>
<td>3-8</td>
<td>3-9</td>
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<td>16</td>
<td>5-9</td>
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<td>5-7</td>
<td>5-1</td>
<td>5-2</td>
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<td>7-4</td>
<td>6-9</td>
<td>6-0</td>
<td>6-3</td>
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<td>9-2</td>
<td>8-1</td>
<td>7-6</td>
<td>6-7</td>
<td>6-10</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm; 1 psf = 0.0479 kN/m²; 1 ft = 0.3 m

a. Table values are based on tensile reinforcement with a minimum yield strength of 40,000 psi (276 MPa), concrete with a minimum specified compressive strength of 2,500 psi (17.2 MPa), and a building width (clear span) of 32 feet (9.8m).

b. Spans located in shaded cells shall be permitted to be multiplied by 1.05 when concrete with a minimum compressive strength of 3,000 psi (20.7 MPa) is used or by 1.1 when concrete with a minimum compressive strength of 4,000 psi (27.6 MPa) is used.

c. Deflection criterion is \( L/240 \), where \( L \) is the clear span of the lintel in inches.

d. Linear interpolation shall be permitted between ground snow loads and between lintel depths.

e. Lintel depth, \( D \), shall be permitted to include the available height of ICF wall located directly above the lintel, provided that the increased lintel depth spans the entire length of the opening.

f. Spans shall be permitted to be multiplied by 1.05 for a building width (clear span) of 28 feet (8.5 m).

g. Spans shall be permitted to be multiplied by 1.1 for a building width (clear span) of 24 feet (7.3 m) or less.

h. ICF wall dead load is 69 psf (3.3 kPa).

Delete Figure R611.7(2) and substitute with new Figure R611.7(2) as follows:
**R611.7.3.4 Load-bearing walls.** Lintels for in flat and screen-grid ICF load-bearing walls supporting roof or floor loads shall comply with Table R611.7(2), or Table RR611.7(3) or Table R611.7(8). Lintels for in waffle-grid ICF load-bearing walls supporting roof or floor loads shall comply with Table R611.7(4), or Table R611.7(5) or Table R611.7(8). Lintels in screen-grid ICF load-bearing walls shall comply with Table R611.7(6) or Table R611.7(7).

**Exception:** Where spans larger than those permitted in Table R611.7(2), Table R611.7(3), Table R611.7(4), or Table R611.7(5), R611.7(6), R611.7(7) or R611.7(8) are required, the lintels shall comply with Table R611.7(6) (9).
R611.7.3.5 Nonload-bearing walls. Lintels for nonload-bearing flat, waffle-grid and screen-grid ICF walls shall comply with Table R611.7(7)(10). Stirrups are not required.

Revise existing Table R611.7(6) (Supp) by adding screen-grid provisions at the bottom of the table and renumber to Table R611.7(9):

<table>
<thead>
<tr>
<th>Minimum Bottom Lintel Reinforcement</th>
<th>Minimum Bottom Lintel Reinforcement</th>
<th>Minimum Bottom Lintel Reinforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lintel Thickness, (T)³ (inches)</td>
<td>Lintel Depth, D (inches)</td>
<td>Supporting Roof</td>
</tr>
<tr>
<td>Supporting Light-Frame Second Story and Roof</td>
<td>Supporting Light-Frame Second Story and Roof</td>
<td></td>
</tr>
<tr>
<td>Maximum Ground Snow Load (psf)</td>
<td>Max. Ground Snow Load (psf)</td>
<td>Supporting ICF Second Story and Roof</td>
</tr>
<tr>
<td>Flat ICF Lintel, 12 Feet – 3 Inches Maximum Clear Span</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>Flat ICF Lintel, 16 Feet – 3 Inches Maximum Clear Span</td>
<td>(No change to table values)</td>
<td>Supporting ICF Second Story and Roof</td>
</tr>
<tr>
<td>Waffle-Grid ICF Lintel, 12 Feet – 3 Inches Maximum Clear Span</td>
<td>(No change to table values)</td>
<td>Supporting ICF Second Story and Roof</td>
</tr>
<tr>
<td>Screen-Grid ICF Lintel, 12 Feet – 3 Inches Maximum Clear Span</td>
<td>(No change to table values)</td>
<td>Supporting ICF Second Story and Roof</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m², 1 psf = 0.0479 kN/m²

a. This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.

b. This table is not intended to prohibit the use of ICF manufacturers tables based on engineering analysis in accordance with ACI 318.

c. D/R indicates design is required.

d. Deflection criterion: L/240.

e. Interpolation is permitted between ground snow loads and between lintel depths.

f. No. 3 stirrups are required a maximum d/2 spacing for spans greater than 4 feet.

For SI: 1 inch = 25.4 mm, 1 foot = 0.3048 m, 1 psi = 6.895 kN/m², 1 psf = 0.0479 kN/m²

a. This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.

b. This table is not intended to prohibit the use of ICF manufacturers tables based on engineering analysis in accordance with ACI 318.

c. D/R indicates design is required.

d. Deflection criterion: L/240.

e. Interpolation is permitted between ground snow loads and between lintel depths.

f. No. 3 stirrups are required a maximum d/2 spacing for spans greater than 4 feet.

g. Actual thickness is shown for flat lintels while nominal thickness is given for waffle-grid and screen-grid lintels. Lintel thickness corresponds to the nominal waffle-grid and screen-grid ICF wall thickness with a minimum web thickness of 2 inches (51 mm). Refer to Section R611.4(2) for actual wall thickness.

h. ICF wall dead load is maximum 55 psf (2.6 kPa). ICF wall dead load varies based on wall thickness using 150pcf concrete density.

Delete existing Table R611.7(7) (Supp) and substitute with new Table R611.7(10) as follows:
TABLE R611.7(10)  
MAXIMUM ALLOWABLE CLEAR SPANS FOR  
ICF LINTELS IN NON-LOAD-BEARING WALLS WITHOUT STIRRUPS a, b, c, d  
NO. 4 BOTTOM BAR

<table>
<thead>
<tr>
<th>Minimum Lintel Thickness, T (inches)</th>
<th>Minimum Lintel Depth, D (inches)</th>
<th>Maximum Clear Span</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Supporting Light-Frame Non-Bearing Wall (feet-inches)</td>
</tr>
<tr>
<td><strong>Flat ICF Lintel</strong></td>
<td></td>
<td>Light-Frame Non-Bearing Wall (feet-inches)</td>
</tr>
<tr>
<td>3.5</td>
<td>8</td>
<td>11-1</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>15-11</td>
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<td>16</td>
<td>16-3</td>
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<td>16-3</td>
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<td>24</td>
<td>16-3</td>
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<td>5.5</td>
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<td>7.5</td>
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<td>16-3</td>
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<tr>
<td></td>
<td>24</td>
<td>16-3</td>
</tr>
<tr>
<td><strong>Waffle-Grid ICF Lintel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 or 8</td>
<td>8</td>
<td>9-1</td>
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<td>12</td>
<td>13-4</td>
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<tr>
<td></td>
<td>24</td>
<td>16-3</td>
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<tr>
<td><strong>Screen-Grid Lintel</strong></td>
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<tr>
<td>6</td>
<td>12</td>
<td>5-8</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>16-3</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 0.3048 m; 1 inch = 25.4 mm; 1 psf = 47.8804 Pa

a. This table is based on concrete with a minimum specified compressive strength of 2,500 psi, reinforcing steel with a minimum yield strength of 40,000 psi and an assumed equivalent rectangular cross section. When reinforcement with a minimum yield strength of 60,000 psi is used the span lengths in the shaded cells shall be increased by 1.2 times the table values.
b. This table is not intended to prohibit the use of ICF manufacturers tables based on engineering analysis in accordance with ACI 318.
c. Deflection criterion is L/240, where L is the clear span of the lintel in inches.
d. Linear interpolation is permitted between lintel depths.

Proponent’s Reason:
T. R611.7(1):
This proposed change simplifies Table R611.7(1). In addition, some of the information in the existing Table R611.7(1) is inconsistent with the lintel tables. This proposal corrects those inconsistencies. Finally, the proposal provides requirements for Seismic Design Category D and D2 buildings.

R611.7.3.1 (Supp):
Separate lintel span tables and figures are needed for screen-grid ICF systems. The span tables are based on an analysis in conformance with ACI 318 and recent structural testing and research of ICF lintels (Lintel Testing for Reduced Shear Reinforcement in Insulating Concrete Form Systems, HUD – PCA 1998 and Testing and Design of Lintels Using Insulating Concrete Forms, HUD – PCA 2000).

R611.7.3.2:
This proposal places provisions for screen-grid lintels in load bearing walls. In addition, the current stirrup requirements are made more efficient and accurate by specifying the middle portion of the span where stirrups are not required in Tables R611.7(2), R611.7(3), R611.7(4) and R611.7(5) for flat and waffle-grid ICF lintels.

F. R611.7(2):
Figure R611.7.2 is being revised to meet the changes in the text and additional tables.
R611.7.3.4: Sections R611.7.3.4 and R611.7.3.5 are revised to coordinate with the added Tables R611.7(6), R611.7(7) and R611.7(8).

T. R611.7(6): The numbering was changed to coincide with the previous changes. In addition, reinforcing requirements have been added for the screen-grid lintels.

T. R611.7(7)(Supp): Reinforcing requirements are being added for the screen-grid lintels. The revised table will also permit differing depths of lintels.

Committee Action: Disapproved
Committee Reason: The proponent has not provided adequate backup information or test results to support the high wind and high seismic prescriptive requirements in Table R611.7(1).

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Stephen V. Skalko, Portland Cement Association, requests Approved as Submitted.

Commenter’s Reason: RB123-02 primarily revises the lintel requirements for screen-grid ICF walls and was considered before RB122-02 by the IRC Code Change Committee in Pittsburgh. Unfortunately, replacement Table R611.7(1) proposed within RB123-02 contained references to Seismic Performance Categories D1 and D2. Prescriptive provisions for SDC D categories are a part of proposal RB122-02 not RB123-02 therefore the committee took the only logical action at that time, which was for Disapproval (D). The Committee did approve RB122-02 As Modified (AM) thus taking the first major step to incorporate prescriptive provisions for ICF walls in high seismic areas into the IRC. If the action on RB122-02 is sustained by the voting membership, the reason for disapproval of RB123-02 by the committee is no longer valid, therefore RB123-02 should be approved As Submitted (AS)

RB124-02

R702.1

Proposed Change as Submitted:


Revise as follows:

R702.1 General. Interior coverings or wall finishes shall be installed in accordance with this chapter and Tables R702.1(1), Table R702.1(2), Table R702.1(3) and Table R702.3.5. Interior masonry veneer shall comply with the requirements of Table R703.4. Interior finishes and materials shall conform to the flame spread and smoke-density requirements of R319.

Proponent’s Reason: To correlate the requirements of R702.1 and Table 703.7.1 to include interior veneer and other construction.

Committee Action: Approved as Submitted
Committee Reason: To correlate the requirements of R702.1 and Table 703.7.1 to include interior veneer and other construction.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joseph Knarich, National Association of Home Builders, requests Approved as Modified by this comment.

Modify proposal as follows:

R702.1 General. Interior coverings or wall finishes shall be installed in accordance with this chapter and Tables R702.1(1), Table R702.1(2), Table R702.1(3) and Table R702.3.5. Interior masonry veneer shall comply with the requirements of Table R703.4 Section R703.7.1 for support and Section R703.7.4 for anchorage, except an air space is not required. Interior finishes and materials shall conform to the flame spread and smoke-density requirements of R319.

Commenter’s reason: The current proposal mandates that interior veneer match all exterior veneer requirements. This modification provides an exemption from waterproofing and drainage requirements for interior masonry construction. These onerous requirements would provide no function, require additional labor, and increase the cost of construction.

RB125-02

R703.2 (IBC 1404.2)

Proposed Change as Submitted:

Proponent: Rick Davidson, representing the Minnesota Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IRC R703.2 Weather-resistant sheathing paper. Asphalt-saturated felt free from holes and breaks, weighing not less than 14 pounds per 100 square feet (0.683 kg/m^2) and complying with ASTM D-226 or other approved weather-resistant materials shall be applied over studs or sheathing of all exterior walls as required by Table R703.4. A minimum of one layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D-226 for Type 1 felt or other approved weather-resistant materials shall be applied over studs or sheathing of all exterior walls as required by Table R703.4.
such felt or material shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, felt shall be lapped not less than 6 inches (152 mm). Building paper or other approved material shall be continuous to the top of walls and terminated at penetrations and building appendages in such a manner to meet the requirements of the exterior wall envelope as described in Section R703.1.

**Exception:** Such felt or material is permitted to be omitted in the following situations:

1. In detached accessory buildings.
2. Under panel siding with shiplap joints or battens.
3. Under exterior wall finish materials as permitted in Table R703.4.
4. Under paper backed stucco lath.

**2. IBC 1404.2 Water-resistive barrier.** A minimum of one layer of No. 15 asphalt felt, complying with ASTM D 226 for Type 1 felt, shall be attached to the studs or sheathing, with flashing as described in Section 1405.3, in such a manner as to provide a continuous water-resistant barrier behind the exterior wall veneer.

**Proponent's Reason:** “APA has expanded its wall construction recommendations to include building paper or other code-approved weather-resistant or air infiltration barrier material in all frame wall systems that include wood structural panel sheathing and/or siding materials.

Most building codes continue to recognize that properly applied wood structural panel sheathing acts as a weather-resistive barrier, traditionally functioning to protect the wood stud cavity and interior finish. However, modern building practices, in the interest of energy conservation, have tended to seal houses much more tightly than was the case prior to conservation concerns. While these practices have saved energy, they have also unwittingly hampered air exchange, occasionally leading to condensation and other moisture-related building envelope performance problems due to reduced ability to dry out when the components get wet. Adding further to the potential for problems, the shortage of well trained and experienced framers, siding installers and other construction trade professionals is expected by expert observers to worsen, thus increasing the likelihood of product misapplication and exacerbating performance callbacks, claims and concerns.

Therefore, the decreased natural drying ability in walls and the increased sensitivity to potential misapplication of any of the various wall elements act to make the more general use of building paper desirable as inexpensive added protection, particularly in those parts of the country that have experienced moisture-related building envelope performance problems.”

Research on dozens of homes in Minnesota by the Building Codes and Standards Division of Minnesota has revealed an alarming deterioration problem caused by the inability of today’s exterior finishes to properly shed rainwater. This problem would be greatly lessened by the expanded use of building paper.

And while the problem in Minnesota has been documented, many areas of the country receive significantly greater rainfall and greater likelihood of wind driven rain making this a national problem as is evidenced by the APA - Engineered Wood Association position paper.

The longevity of today’s homes is at risk from the damage posed by excess moisture. This code change will help to lessen that risk.

**ITEM 1 (IRC)**

**Committee Action:** Approved as Modified

Modify proposal as follows:

**IRC R703.2 Weather-resistive sheathing paper.** A minimum of one layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D 226 for Type 1 felt or other approved weather-resistant materials shall be applied over studs or sheathing of all exterior walls. (See Table R703.4). Such felt or material shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, felt shall be lapped not less than 6 inches (152 mm). Building paper or other approved material shall be continuous to the top of walls and terminated at penetrations and building appendages in such a manner to meet the requirements of the exterior wall envelope as described in Section R703.1.

**Exception:** Such felt or material is permitted to be omitted in the following situations:

1. In detached accessory buildings.
2. Where specifically prohibited by a sheathing and/or siding manufacturer.

**Committee Reason:** Based on proponent’s published reason. The modification was made to permit omission of the felt only if sheathed with an approved weather resistant barrier.

**Assembly Action:** No Motion

**ITEM 2 (IBC)**

**Committee Action:** Disapproved

**Committee Reason:** The proposed change lacks justification as to identification of the problem and the proposed solution. The added text may be interpreted as requiring a second vapor barrier on the exterior of the building.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

**Public Comment:**

Gary W. Walker, PE, Walker Engineering, Inc., representing the Manufactured Housing Institute, requests Disapproved.

**Commenter’s Reason:** The code change will require a weather-resistive sheathing paper for exterior sheathing or exterior siding that is a weather-resistive barrier. The code presently recognizes exterior sheathing or exterior siding that functions as a weather-resistive barrier without the additional expense of installing another weather-resistive sheathing of paper. The proposal will require the permit applicant to provide documentation to the Building Department for exterior sheathing or exterior siding that is presently recognized in the code as
an approved weather-resistant barrier. The submission of this information is unnecessary under the existing code section since common types of exterior sheathing and exterior siding are listed in the exception.

If the proposal is adopted, the manufacturers for these exterior sheathing and exterior siding products will need to get code evaluation reports. These evaluation reports or other documentation will be required to be submitted and specifically approved by the Building Department for each building using these presently listed weather-resistant exterior sheathing or exterior siding.

**Analysis:** The following combinations of actions would achieve technical consistency between the IBC and the IRC:

- Item 1 AS Item 2 AS
- Item 1 AM item 2 AS

**Proposed Change as Submitted:**

**Proponent:** Rick Davidson, representing the Minnesota Building Officials
### WEATHER-RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

<table>
<thead>
<tr>
<th>Siding Material</th>
<th>Nominal Thickness (inches)</th>
<th>Joint Treatment</th>
<th>Sheathing Paper Required</th>
<th>Type of Supports for the Siding Material and Fasteners&lt;sup&gt;3,4&lt;/sup&gt;</th>
<th>Wood or wood structural panel sheathing</th>
<th>Fiberboard sheathing into stud</th>
<th>Gypsum sheathing into stud</th>
<th>Foam plastic sheathing into stud</th>
<th>Direct to studs</th>
<th>Number or spacing of fasteners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal aluminum&lt;sup&gt;5&lt;/sup&gt;</td>
<td>0.019&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>0.120 nail 1 ⅛&quot; long</td>
<td>0.120 nail 2&quot; long</td>
<td>0.120 nail 2&quot; long</td>
<td>0.120 nail&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Not allowed</td>
<td>Same as stud spacing</td>
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</tr>
<tr>
<td></td>
<td>0.024</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>0.120 nail 1 ⅛&quot; long</td>
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<td>0.120 nail 2&quot; long</td>
<td>0.120 nail&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Not allowed</td>
<td>Same as stud spacing</td>
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<tr>
<td></td>
<td>0.019</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>0.120 nail 1 ⅛&quot; long</td>
<td>0.120 nail 2 ⅜&quot; long</td>
<td>0.120 nail 2 ⅜&quot; long</td>
<td>0.120 nail&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.120 nail&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Same as stud spacing</td>
<td></td>
</tr>
<tr>
<td>Brick veneer</td>
<td>2</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>See Section R703 and Figure R703.7&lt;sup&gt;i&lt;/sup&gt;</td>
<td>See Section R703 and Figure R703.7&lt;sup&gt;i&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete masonry veneer</td>
<td>2</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>See Section R703 and Figure R703.7&lt;sup&gt;i&lt;/sup&gt;</td>
<td>See Section R703 and Figure R703.7&lt;sup&gt;i&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardboard&lt;sup&gt;6&lt;/sup&gt;</td>
<td>7/16</td>
<td>Note r</td>
<td>Note r Yes</td>
<td>Note o</td>
<td>Note o</td>
<td>Note o</td>
<td>Note o</td>
<td>Note o</td>
<td>Note o</td>
<td>6&quot; panel edges 12&quot; inter. sup.&lt;sup&gt;j&lt;/sup&gt;</td>
</tr>
<tr>
<td>Panel siding-vertical</td>
<td>7/16</td>
<td>Note r</td>
<td>Note r Yes</td>
<td>Note o</td>
<td>Note o</td>
<td>Note o</td>
<td>Note o</td>
<td>Note o</td>
<td>Note o</td>
<td>6&quot; panel edges 12&quot; inter. sup.&lt;sup&gt;j&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hardboard&lt;sup&gt;6&lt;/sup&gt;</td>
<td>7/16</td>
<td>Note g</td>
<td>Note g Yes</td>
<td>Note q</td>
<td>Note q</td>
<td>Note q</td>
<td>Note q</td>
<td>Note q</td>
<td>Note q</td>
<td>Same as stud spacing 2 per bearing</td>
</tr>
<tr>
<td>Steel&lt;sup&gt;6&lt;/sup&gt;</td>
<td>29 ga.</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>0.113 nail 1 ¾&quot;</td>
<td>0.113 nail 2 ⅜&quot;</td>
<td>0.113 nail 2 ⅜&quot;</td>
<td>0.113 nail&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Not allowed</td>
<td>Same as stud spacing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Staple-1 ¾&quot;</td>
<td>Staple-2 ⅛&quot;</td>
<td>Staple-2 ⅛&quot;</td>
<td>Staple&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Not allowed</td>
<td>Same as stud spacing</td>
<td></td>
</tr>
<tr>
<td>Stone veneer</td>
<td>2</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>See Section R703 and Figure R703.7&lt;sup&gt;i&lt;/sup&gt;</td>
<td>See Section R703 and Figure R703.7&lt;sup&gt;i&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Particleboard panels</td>
<td>3/8 - ⅝</td>
<td>Note g</td>
<td>Note g Yes</td>
<td>6d box nail</td>
<td>6d box nail</td>
<td>6d box nail</td>
<td>box nail&lt;sup&gt;1&lt;/sup&gt;</td>
<td>6d box nail, 3/8 not allowed</td>
<td>6&quot; panel edge 12&quot; inter. sup.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5/8</td>
<td>Note g</td>
<td>Note g Yes</td>
<td>6d box nail</td>
<td>8d box nail</td>
<td>8d box nail</td>
<td>box nail&lt;sup&gt;1&lt;/sup&gt;</td>
<td>6d box nail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plywood panel&lt;sup&gt;1&lt;/sup&gt; (exterior grade)</td>
<td>3/8</td>
<td>Note g</td>
<td>Note g Yes</td>
<td>0.099 nail-2&quot;</td>
<td>0.113 nail-2 ⅛&quot;</td>
<td>0.099 nail-2&quot;</td>
<td>0.113 nail&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.099 nail-2&quot;</td>
<td>6&quot; on edges</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Vinyl Siding&lt;sup&gt;7&lt;/sup&gt;</td>
<td>0.035</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>0.120 nail 1 ⅛&quot;</td>
<td>0.120 nail 2&quot;</td>
<td>0.120 nail 2&quot;</td>
<td>0.120 nail&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Not allowed</td>
<td>Same as stud spacing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Staple-1 ¾&quot;</td>
<td>Staple-2 ⅛&quot;</td>
<td>Staple-2 ⅛&quot;</td>
<td>Staple&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Not allowed</td>
<td>Same as stud spacing</td>
<td></td>
</tr>
<tr>
<td>Wood&lt;sup&gt;8&lt;/sup&gt; Rustic, drop</td>
<td>3/8 Min</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>Face nailing up to 6&quot; widths, 1 nail per bearing; 8&quot; widths and over, 2 nails per bearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Shiplap</td>
<td>19/32</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>Fastener penetration into stud-1&quot;</td>
<td>0.113 nail-2 ⅛&quot;</td>
<td>Staple-2 ⅛&quot;</td>
<td>Not allowed</td>
<td>Same as stud spacing 2 per bearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bevel</td>
<td>7/16</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>Face nailing up to 6&quot; widths, 1 nail per bearing; 8&quot; widths and over, 2 nails per bearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butt tip</td>
<td>3/16</td>
<td>Lap</td>
<td>Ne Yes</td>
<td>Face nailing up to 6&quot; widths, 1 nail per bearing; 8&quot; widths and over, 2 nails per bearing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiber cement panel siding&lt;sup&gt;9&lt;/sup&gt;</td>
<td>5/16</td>
<td>Note t</td>
<td>Yes</td>
<td>6d corrosion resistant nail&lt;sup&gt;11&lt;/sup&gt;</td>
<td>6d corrosion resistant nail&lt;sup&gt;11&lt;/sup&gt;</td>
<td>6d corrosion resistant nail&lt;sup&gt;11&lt;/sup&gt;</td>
<td>---</td>
<td>4d corrosion resistant nail&lt;sup&gt;11&lt;/sup&gt;</td>
<td>6&quot; oc on edges, 12&quot; oc on intermed. studs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiber cement lap siding&lt;sup&gt;9&lt;/sup&gt;</td>
<td>5/16</td>
<td>Note w</td>
<td>Yes</td>
<td>6d corrosion resistant nail&lt;sup&gt;11&lt;/sup&gt;</td>
<td>6d corrosion resistant nail&lt;sup&gt;11&lt;/sup&gt;</td>
<td>6d corrosion resistant nail&lt;sup&gt;11&lt;/sup&gt;</td>
<td>---</td>
<td>6d corrosion resistant nail&lt;sup&gt;11&lt;/sup&gt;</td>
<td>Note x</td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm

a. Based on stud spacing of 16 inches on center Where studs are spaced 24 inches, siding shall be applied to sheathing approved for that spacing.
b. Nail is a general description and shall be T-head, modified round head, or round head with smooth or deformed shanks.
c. Staples shall have a minimum crown width of 7/16-inch outside diameter and be manufactured of minimum No. 16 gage wire.
d. Nails or staples shall be aluminum, galvanized, or rust-preventive coated and shall be driven into the studs for fiberboard or gypsum backing.
e. Aluminum nails shall be used to attach aluminum siding.
f. Aluminum (0.019 inch) shall be unbacked only when the maximum panel width is 10 inches and the maximum flat area is 8 inches. The tolerance for aluminum siding shall be ±0.002 inch of the nominal dimension.
g. If boards or panels are applied over sheathing or a weather-resistant membrane, joints need not be treated. Otherwise, vertical joints shall occur at studs and be covered with battens or be lapped.
h. All attachments shall be coated with a corrosion-resistant coating.
i. Shall be of approved type.
j. Three-eighths-inch plywood shall not be applied directly to studs spaced greater than 16 inches on center when long dimension is parallel to
   studs. One-half-inch plywood shall not be applied directly to studs spaced greater than 24 inches on center. The stud spacing shall not
   exceed the panel span rating provided by the manufacturer unless the panels are installed with the face grain perpendicular to studs or over
   sheathing approved for that stud spacing.
k. Woodboard sidings applied vertically shall be nailed to horizontal nailing strips or blocking set 24 inches on center Nails shall penetrate 1.5
   inches into studs, studs and wood sheathing combined, or blocking. A weather-resistant membrane shall be installed weatherboard fashion
   under the vertical siding unless the siding boards are lapped or battens are used.
l. Hardboard siding shall comply with AHA A135.6.
m. For masonry veneer, a weather resistant membrane or building paper is not required over water repellent sheathing materials when a 1-inch air
   space is provided between the veneer and the sheathing. When the 1-inch space is filled with mortar, a weather resistant membrane or building
   paper is required over studs or sheathing.
n. Vinyl siding shall comply with ASTM D 3679.
o. Minimum shank diameter of 0.092 inch, minimum head diameter of 0.225 inch, and nail length must accommodate sheathing and penetrate
   framing 1.5 inches.
p. When used to resist shear forces, the spacing must be 4 inches at panel edges and 8 inches on interior supports.
q. Minimum shank diameter of 0.099 inch, minimum head diameter of 0.240 inch, and nail length must accommodate sheathing and penetrate
   framing 1.5 inches.
r. Vertical end joints shall occur at studs and shall be covered with a joint cover or shall be caulked.
s. Fiber cement siding shall comply with the requirements of ASTM C 1186.
t. See R703.10.1.
u. Minimum 0.102" smooth shank, 0.255" round head.
v. Minimum 0.099" smooth shank, 0.250" round head.
w See R703.10.2.
x. Face nailing: 2 nails at each stud. Concealed nailing: one 11 gage 1-1/2 galv. roofing nail (0.371" head diameter, 0.120" shank) or 6d galv. box
   nail at each stud.
y. See R703.2 Exceptions.
z. Minimum nail length must accommodate sheathing and penetrate framing 1.5 inches.

**Proponent's Reason:** Most building codes continue to recognize that properly applied wood structural panel sheathing acts as a weather-
resistive barrier, traditionally functioning to protect the wood stud cavity and interior finish. However, modern building practices, in the interest
of energy conservation, have tended to seal houses much more tightly than was the case prior to conservation concerns. While these practices
have saved energy, they have also unwittingly hampered air exchange, occasionally leading to condensation and other moisture-
related building envelope performance problems due to reduced ability to dry out when the components get wet. Adding further to the
potential for problems, the shortage of well-trained and experienced framers, siding installers and other construction trade professionals is
expected by expert observers to worsen, thus increasing the likelihood of product misapplication and exacerbating performance callbacks,
claims and concerns.

Therefore, the decreased natural drying ability in walls and the increased sensitivity to potential misapplication of any of the various
wall elements act to make the more general use of building paper desirable as inexpensive added protection, particularly in those parts of
the country that have experienced moisture-related building envelope performance problems.

Research on dozens of homes in Minnesota by the Building Codes and
Standards Division of Minnesota has revealed an alarming deterioration problem caused by the inability of today’s exterior finishes to
properly shed rainwater. This problem would be greatly lessened by the expanded use of building paper.

And while the problem in Minnesota has been documented, many areas of the country receive significantly greater rainfall and greater
likelihood of wind driven rain making this a national problem as is evidenced by the APA - Engineered Wood Association position paper.

The longevity of today’s homes is at risk from the damage posed by excess moisture. This code change will help to lessen that risk.

**Committee Action:** Approved as Modified

Modify proposal as follows:

**TABLE R703.4 (Supp)**

<table>
<thead>
<tr>
<th>Siding Material</th>
<th>Sheathing Paper Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brick veneer</td>
<td>Yes</td>
</tr>
<tr>
<td>Concrete masonry veneer</td>
<td>(Note m)</td>
</tr>
<tr>
<td>Stone veneer</td>
<td>Yes</td>
</tr>
<tr>
<td>(Note m)</td>
<td></td>
</tr>
<tr>
<td>Fiber cement panel siding</td>
<td>Yes</td>
</tr>
<tr>
<td>(Note y)</td>
<td></td>
</tr>
<tr>
<td>Fiber cement lap siding</td>
<td>Yes</td>
</tr>
<tr>
<td>(Note y)</td>
<td></td>
</tr>
</tbody>
</table>

(Remainder of table unchanged)

(Notes a through l unchanged)

**m.** For masonry veneer, a weather-resistant sheathing paper is not required over a sheathing that performs as a weather-resistive
barrier when a 1-inch air space is provided between the veneer and the sheathing. When the 1-inch space is filled with mortar, a
weather-resistant sheathing paper is required over studs or sheathing.

(Notes n through z unchanged)

**Committee Reason:** Based on proponent's published reason, the modification was made to indicate Note y applied to all siding material
and to retain the Note m for brick, concrete and stone veneer.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**
To remove the moisture from the wall cavity requires that the wall cavity allow the moisture to escape by either ventilation or evaporation through the wall membranes. During cold weather evaporation through the wall membranes is not a practical option. Providing ventilation of the wall cavity could create a violation of the fireblocking requirements (Section R602.8 Fireblocking required). The best option for preventing the accumulation of moisture in the wall cavity is to prevent the infiltration from the exterior by installing the exterior siding or exterior sheathing that provides a complete weather-resistive barrier at all wall joints and wall openings. The exterior siding and exterior sheathing materials affected by this proposal are weather-resistive barriers. The condensation problem will require either a method for ventilating the wall cavity without violating the fireblocking requirements or the moisture must escape through interior membranes of the wall to be removed by the building HVAC systems.

The installation of a weather-resistive paper behind exterior siding or exterior sheathing that is a weather-resistive barrier will not correct the problem of eliminating or removing excessive moisture in the wall cavity.

**RB133-02**

**R802.10**

**Proposed Change as Submitted:**

**Proponent:** Rick Davidson, representing the Minnesota Building Officials

Add new text as follows:

**R802.10.5 Truss tie downs.** Trusses shall be connected to wall plates by the use of approved connectors having a resistance to uplift of not less than 175 pounds (79.45 kg) and shall be installed in accordance with the manufacturer's specifications. For roof assemblies subject to wind uplift pressures of 20 pounds per square foot (0.958 kN/m²) or greater, as established in Table R301.2(2), adjusted for height and exposure per Table R301.2(3). See Section R802.11.

**Proponent's Reason:** One of the most important connections in the construction of a dwelling is the roof-to-wall connection. This amendment will result in a significant improvement in the ability of roofs to resist wind uplift, provide a more reasonable means to attach trusses to plates, and do so at a very minimal increase in cost. Building inspectors for years have complained that toe nailing trusses is an unacceptable means to achieve these connections which often result in splintered wood members with little uplift resistance. Many builders and homeowners already use these connectors on a regular basis.

Similar approaches are used in other sections such as R502.6 for joist bearing ( . . . by the use of approved joist hangers) and R802.3 for ridge board alternates ( . . . to each other with a gusset plate as a tie).

**Committee Action:** Disapproved

**Committee Reason:** The truss manufacturer should specify the type of connection required for the truss.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Patrick Parsley, City of Fairmont, representing the Minnesota Building Officials, requests Approved as Modified by this comment.

802.10.5 Truss tie-downs, to wall connection: Trusses shall be connected to wall plates by the use of approved connectors having a resistance to uplift of not less than 175 pounds (79.45 kg) and shall be installed in accordance with the manufacturer's specifications. For roof assemblies subject to wind uplift pressures of 20 pounds per square foot (0.958 kN/m²) or greater, as established in Table R301.2(2), adjusted for height and exposure per Table R301.2(3). See section R802.11.

**Commenter's Reason:** At the hearings the committee sighted the responsibility for this connection should be with the manufacturer. Most Building Officials would probably disagree and place the responsibility with the truss designer. In the end neither the manufacturer nor the designer will consistently detail this connection unless it is a special situation thereby leaving the inspector to accept an inappropriate connection or design and require the appropriate anchor.

It is assumed that "standard practice" will suffice at this location. It is failing because the slanted nail connection is splintering the truss cord and compromising the truss stability and at the same time not providing an equivalent connection used for the conventionally framed roof which called for nails slanted into the plate for both the rafter and the ceiling joist.

This "common connection" for the engineered roof to the conventional roof framing should be delineated with the proper framing anchor in order to maintain the same structural integrity as expected in a conventionally framed roof. The anchor specified is already required in some jurisdictions in MN. The Building Official needs this code language to be able to enforce an adequate connection. Trusses are a relatively new system being integrated into existing code language. The code must keep up to the new technology and this is one of those necessary changes.

This modification also retitles this section to remove confusion with the truss tie-down section.

**RB138-02**

**R905.2.7.1 (IBC 1507.2.8.2)**

**Proposed Change as Submitted:**

**Proponent:** Rick Davidson, representing the Minnesota Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC FIRE SAFETY
CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IRC R905.2.7.1 (Supp) Ice protection. In areas where the average daily temperature in January is 25°F (-4°C) or less or when Table R301.2(1) criteria so designates, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall be used in lieu of normal underlayment and extend from the eave’s edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   **Exception:** Detached accessory structures that contain no conditioned floor area.

2. IBC 1507.2.8.2 Ice dam protection. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall be used in lieu of normal underlayment and extend from the eave’s edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   **Exception:** Detached accessory structures that contain no conditioned floor area.

**Proponent’s Reason:** The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

**ITEM 1 (IRC)**
Committee Action: Approved as Submitted

Committee Reason: The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

Assembly Action: No Motion

**ITEM 2 (IBC)**
Committee Action: Disapproved

Committee Reason: The term “accessory structure” is defined in the IRC but not in the IBC. Ice protection should be provided for certain accessory structures based on the nature of the use, such as those storing equipment which may be damaged due to water infiltration caused by ice dams.

Assembly Action: No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

**Analysis:** The following combinations of actions would achieve technical consistency between the IBC and the IRC:

- Item 1 AS  Item 2 AS
- Item 1 D  Item 2 D

**RB139-02**

**R905.4.3 (IBC 1507.5.3)**

*Proposed Change as Submitted:*

**Proponent:** Rick Davidson, representing the Minnesota Building Officials

**THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**

Revise as follows:

1. IRC R905.4.3 (Supp) Underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or when Table R301.2(1) criteria so designates, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall be used in lieu of normal underlayment and extend from the eave’s edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   **Exception:** Detached accessory structures that contain no conditioned floor area.

2. IBC 1507.5.3 Underlayment. Underlayment shall conform with ASTM D226, Type I. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall be used in lieu of normal underlayment and extend from the eave’s edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   **Exception:** Detached accessory structures that contain no conditioned floor area.

**Proponent’s Reason:** The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.
ITEM 1 (IRC)
Committee Action: Approved as Submitted
Committee Reason: The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

Assembly Action: No Motion

ITEM 2 (IBC)
Committee Action: Disapproved
Committee Reason: Consistent with the action taken on RB138-02.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Analysis: The following combinations of actions would achieve technical consistency between the IBC and the IRC:
Item 1 AS Item 2 AS
or
Item 1 D item 2 D

RB140-02
R905.5.3 (IBC 1507.6.3)

Proposed Change as Submitted:

Proponent: Rick Davidson, representing the Minnesota Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IRC R905.5.3 (Supp) Underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less, or when Table R301.2(1) criteria so designates, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall extend from the eave's edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building. Underlayment shall conform with ASTM D 226, Type I.

   Exception: Detached accessory structures that contain no conditioned floor area.

2. IBC 1507.6.3 Underlayment. Underlayment shall conform with ASTM D 226, Type I. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall extend from the eave's edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   Exception: Detached accessory structures that contain no conditioned floor area.

Proponent's Reason: The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

ITEM 1 (IRC)
Committee Action: Approved as Submitted
Committee Reason: The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

Assembly Action: No Motion

ITEM 2 (IBC)
Committee Action: Disapproved
Committee Reason: Consistent with the action taken on RB138-02.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Analysis: The following combinations of actions would achieve technical consistency between the IBC and the IRC:
Item 1 AS Item 2 AS
or
Item 1 D item 2 D

RB141-02
R905.6.3 (IBC 1507.7.3)

Proposed Change as Submitted:

Proponent: Rick Davidson, representing the Minnesota Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC FIRE SAFETY
CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IRC R905.6.3 (Supp) Underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or when Table R301.2(1) criteria so designates, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall extend from the eave’s edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building. Underlayment shall conform with ASTM D 226, Type I.

   Exception: Detached accessory structures that contain no conditioned floor area.

2. IBC 1507.7.3 Underlayment. Underlayment shall comply with ASTM D 226, Type II. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall extend from the eave’s edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   Exception: Detached accessory structures that contain no conditioned floor area.

Proponent’s Reason: The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

ITEM 1 (IRC)
Committee Action: Approved as Submitted
Committee Reason: The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

Assembly Action: No Motion

ITEM 2 (IBC)
Committee Action: Disapproved
Committee Reason: Consistent with the action taken on RB138-02.
Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Analysis: The following combinations of actions would achieve technical consistency between the IBC and the IRC:
Item 1AS Item 2 AS
or
Item 1 D Item 2 D

RB142-02
R905.7.3 (IBC 1507.8.3)

Proposed Change as Submitted:

Proponent: Pat Parsley, representing the Minnesota Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IRC R905.7.3 (Supp) Underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or when Table R301.2(1) criteria so designates, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall extend from the eave’s edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   Exception: Detached accessory structures that contain no conditioned floor area.

2. IBC 1507.8.3 Underlayment. Underlayment shall comply with ASTM D 226, Type I. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall extend from the eave’s edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   Exception: Detached accessory structures that contain no conditioned floor area.

Proponent’s Reason: The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

ITEM 1 (IRC)
Committee Action: Approved as Submitted
Committee Reason: The added cost of ice protection in unheated
accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

**Assembly Action:** No Motion

**ITEM 2 (IBC)**

**Committee Action:** Disapproved

**Committee Reason:** Consistent with the action taken on RB138-02.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

**Analysis:** The following combinations of actions would achieve technical consistency between the IBC and the IRC:

- Item 1 AS Item 2 AS
- Item 1 D item 2 D

---

**RB143-02**

**R905.8.3 (IBC 1507.9.3)**

**Proposed Change as Submitted:**

**Proponent:** Pat Parsley, representing the Minnesota Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

**Revise as follows:**

1. **IRC R905.8.3 (Supp) Underlayment.** In areas where the average daily temperature in January is 25°F (−4°C) or less, or when Table R301.2(1) criteria so designates, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall extend from the eave's edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building. Underlayment shall conform with ASTM D 226, Type I.

   **Exception:** Detached accessory structures that contain no conditioned floor area.

2. **IBC 1507.9.3 Underlayment.** Underlayment shall conform with ASTM D 226, Type I. In areas where the average daily temperature in January is 25°F (−4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall extend from the eave's edge to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

   **Exception:** Detached accessory structures that contain no conditioned floor area.

**Proponent’s Reason:** The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

**ITEM 1 (IRC)**

**Committee Action:** Approved as Submitted

**Committee Reason:** The added cost of ice protection in unheated accessory structures such as sheds, garages, and small agricultural buildings is not worth the minimal benefit, if any, that the ice protection provides. Many building departments do not enforce this provision on accessory structures. Others do so reluctantly.

**Assembly Action:** No Motion

**ITEM 2 (IBC)**

**Committee Action:** Disapproved

**Committee Reason:** Consistent with the action taken on RB138-02.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

**Analysis:** The following combinations of actions would achieve technical consistency between the IBC and the IRC:

- Item 1 AS Item 2 AS
- Item 1 D item 2 D

---

**RB147-02**

**N1101.1**

**Proposed Change as Submitted:**

**Proponent:** John Hogan, City of Seattle, WA

**Revise as follows:**

**N1101.1 Scope.** This chapter sets forth energy-efficiency-related requirements for the design and construction of buildings regulated by this code.

**Exception:** Provided that they are separated by
building envelope assemblies from the remainder of the building, portions of the building thermal envelope that do not enclose conditioned space shall be exempt from the building envelope provisions, but shall comply with the provisions for building mechanical and service water heating systems.

**Proponent's Reason:** This proposal clarifies and states in a more straightforward manner that unconditioned spaces:

1. are exempt from the building envelope requirements (e.g., for insulation and fenestration),
2. but shall comply with applicable requirements for mechanical and service water heating systems.

All space heating and space cooling equipment should comply with the minimum equipment efficiencies regardless of where they are installed. Water heaters installed in unheated spaces should still comply with the efficiency requirements.

This provides consistency with IECC 101.4.1.

**Committee Action:** Approved as Submitted

**Committee Reason:** Based on proponent's published reason.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Gary W. Walker, PE, Walker Engineering, Inc., representing the Manufactured Housing Institute, requests Disapproved.

**Commenter's Reason:** The exception does not clarify the application of the code to unconditioned spaces. The exception has been revised to include an exception for mechanical and service water heating systems. It is confusing to have an exception within an exception. If the exception is to not require the building envelope enclosing unconditioned spaces from having to comply with the energy-efficiency-related requirements of the building thermal envelope, the exception should not confuse the subject by including references to mechanical and service water heating systems.

**Proposed Change as Submitted:**

**Proponent:** Standards writing organizations as listed below.

**Revise as follows:**

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<thead>
<tr>
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<tr>
<td>ANSI/AAMA/N WWDA 101.4-97</td>
<td>Voluntary Specifications for Aluminum Vinyl (PVC) and Wood Windows and Glass Doors</td>
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<td>AFPA 111 19th Street, NW #800 Farmington Hills, MI 48331</td>
<td>American Forest &amp; Paper Association</td>
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<td>AF&amp;PA NDS–97 01</td>
<td>National Design Specification (NDS) for Wood Construction, and Supplement</td>
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<td>ASTM 100 Barr Harbor Drive West Conshohocken, PA 19428</td>
<td>American Society for Testing and Materials</td>
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<td>A 153-00 01A</td>
<td>Specification for Zinc Coating (Hot-Dip) on Iron and Steel</td>
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<td>A 36/A 36M-00 01</td>
<td>Standard Specification for Carbon Structural Steel</td>
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<td>A 615/A 615M-00 01B</td>
<td>Standard Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement</td>
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<td>A0875/A0875 M-00A 01A</td>
<td>Standard Specification for Sheet Zinc-5% Alloy-Coated by the Hot-Dip Process</td>
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<td>B0633-98 (Re-approved 4/04) A01</td>
<td>Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel</td>
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<td>Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases</td>
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<td>Standard Performance Specification for Blended Hydraulic Cements</td>
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<td>Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing</td>
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<td>Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel</td>
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<td>Specification for Standard Specification for Fiber-Reinforced Gypsum Panels</td>
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<td>Standard Specification for Practice for Installing Clay Flue Lining Liners</td>
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<td>Standard Specification for Nonload-bearing Concrete Masonry Units</td>
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<td>C 1395/C1395M-00 01</td>
<td>Standard Specification for Gypsum Ceiling Board</td>
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<td>Standard Test Methods Sampling and Testing Concrete Masonry Units</td>
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<td>C0216-00 01A</td>
<td>Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)</td>
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<td>C0270-99</td>
<td>Standard Specification for Mortar for Unit Masonry</td>
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<td>C0315-98</td>
<td>Specification for Clay Flue Linings</td>
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<td>C0475-94</td>
<td>Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Wallboard</td>
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<td>C0514-99</td>
<td>Standard Specification for Nails for the Application of Gypsum Board</td>
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<td>C0578-99</td>
<td>Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation</td>
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<td>C0062-99</td>
<td>Standard Specification for Building Brick (Solid Masonry Units Made for Clay or Shale)</td>
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<td>C0630/C0630</td>
<td>Standard Specification for Water-Resistant Gypsum Backing Board</td>
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<td>C0652-99A 01</td>
<td>Standard Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale)</td>
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<td>Standard Test Methods of Sampling and Testing Brick and Structural Clay Tile</td>
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<td>Standard Specification for Calcium Silicate Face Brick (Sand-Lime Brick)</td>
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<td>Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners, Tr</td>
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<td>and Bracing for Screw Application of Gypsum Panel</td>
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<td>Products and Metal Plaster Bases</td>
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<td>C0960C 0064-04</td>
<td>Standard Specification for Predecorated Gypsum Board</td>
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<td>Standard Specification for Gypsum Wallboard</td>
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<td>Standard Specification for Gypsum Lath</td>
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<td>C0079-99 01</td>
<td>Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board</td>
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<td>Steep Roofing Underlayment for Ice Dam Protection</td>
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<td>D 2225-99E01</td>
<td>Standard Specification for Asphalt Shingles (Organic Felt) Surfaces with Mineral Granules</td>
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<td>Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, As</td>
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<td>D 3462-01E01</td>
<td>Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaces</td>
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<td>with Mineral Granules</td>
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<td>D 3468-97 09</td>
<td>Standard Specification for Liquid-Applied Neoprene and Chlorosulfonated Polyethylene</td>
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<td>Used in Roofing and Waterproofing</td>
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<td>D 3679-99</td>
<td>Standard Specification for Rigid Poly (Vinyl Chloride) (PVC Siding)</td>
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<td>D 3747-99E01</td>
<td>Standard Specification for Emulsified Asphalt Adhesive for Adhering Roof Insulation</td>
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<td>Standard Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofi</td>
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<td>D 4434-99 06</td>
<td>Standard Specification for Poly (Vinyl Chloride) Sheet Roofing</td>
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<td>Standard Specification for Asphalt Coated Glass-Fiber Venting Base Sheet Used in Roofing</td>
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<td>D 5055-92E04 00</td>
<td>Standard Specification for Establishing and Monitoring Structural Capacities of Prefab</td>
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<td>D 6162-00A</td>
<td>Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet</td>
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<td>Materials Using a Combination of Polyester and Glass Fiber Reinforcements</td>
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<td>D 6223-09E01</td>
<td>Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materi</td>
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<td>als Using a Combination of Polyester and Glass Fiber Reinforcement</td>
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<td>and Storm Shutters Impacted by Windborne Debris in Hurricanes</td>
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<tr>
<td>F 1667-99 01A</td>
<td>Standard Specification for Driven Fasteners, Nails, Spikes, and Staples</td>
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**AWPA**

American Wood Preservers Association  
P.O. Box 5690  
Granbury, TX 76049

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<tr>
<td>C2-99 01</td>
<td>Lumber, Timbers, Bridge Ties and Mine Ties — Preservative Treatment by Pressure Processes</td>
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<td>C20-99 99</td>
<td>Structural Lumber-Fire-Retardant Treatment by Pressure Processes</td>
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<td>M4-99 01</td>
<td>Standard for the Care of Preservative-Treated Wood Products</td>
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<td>Standard for Creosote Preservative Coal Tar Creosote for Land and Fresh Water and Mine (Coastal Water) Use</td>
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<td>P3-94 01</td>
<td>Standard for Creosote-Petroleum Engine Solutions</td>
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**CPSC**  
Consumer Product Safety Commission  
c/o Superintendent of Documents  
U.S. Government Printing Office  
Washington, DC 20402-9325
### 16 CFR 1201-77

**FM**

Factory Mutual Standards Laboratory Department 1151 Boston Providence Turnpike Norwood, MA 02062

<table>
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**UL**

Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062

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<td>80-90 96</td>
<td>Steel Inside Tanks for Oil-Burner Fuel</td>
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<td>174-98</td>
<td>Household Electric Storage Tank Water Heaters — with Revisions through October 1999</td>
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<td>896-98 93</td>
<td>Oil Burning Stoves — with Revisions through November 1999</td>
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<td>*959-96 01</td>
<td>Medium Heat Appliance Factory Built Chimneys— with Revisions through April 16, 1999</td>
</tr>
<tr>
<td>1040-98 96</td>
<td>Fire Test of Insulated Wall Construction—with Revisions through April 2001</td>
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### Proponent's Reason:

The **ICC Code Development Process for the International Codes (Procedures)** Section 4.5 requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Proposal. In November 2001 a letter was sent to each developer of standards that are referenced in the I-Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the list received of the referenced standards under the maintenance responsibility of the IRC Building/Energy Committee.

*4.5 Updating Standards: The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

### Committee Action:

Approved as Submitted

### Committee Reason:

Based on proponent's published reason.

### Assembly Action:

No Motion

### Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.
RP27-02
Table P2903.8.1

Proposed Change as Submitted:

Proponent: Dave W. Cantrell, Snohomish County Planning & Development Services, WA, representing Washington Association Of Building Officials

Revise as follows:

TABLE P2903.8.1
MANIFOLD SIZING

( No change to Table.)

NOTE: See Table P2903.7 6 for w.s.f.u. and Table 2903.1 for gpm flow rates.

Proponent’s Reason: Table P2903.6 is the proper table to reference for water supply fixture units and Table 2903.1 is the table that provides gallons per minute values for various fixtures, this being what is needed when designing a manifold water distribution system.

Committee Action: Approved as Submitted

Committee Reason: The proposed text provides the correct reference table for sizing a Manifold System.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Dave W. Cantrell, Snohomish County Planning and Development Services, representing Washington Association of Building Officials, requests Approved as Modified by this comment.
### TABLE P2903.6.1
CONVERSION FROM W.S.F.U. TO G.P.M. FLOW RATES

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**Commenter’s Reason:** The proposed modification to include Table P2903.6.1 is needed to convert W.S.F.U. to g.p.m. flow rates for manifold sizing. The IRC does not contain a table to convert such values.

**Proponent:** Steve Yunker, Hendersonville, TN, representing SBCCI Plumbing Code Action Committee

**Proposed Change as Submitted:**

**Revise as follows:**
1. IRC P2903.9.3 Valve requirements. Valves serving individual fixtures, appliances, risers and branches shall be provided with access. An individual shutoff valve shall be required on the water supply pipe to each water closet fixture.

2. IPC 606.2 Location of shutoff valves. Shutoff valves shall be installed in the following locations:

   1. On the fixture supply to each plumbing fixture in other than one- and two-family and multi-family residential occupancies, and other than in individual guestrooms that are provided with unit shutoff valves in hotels, motels, boarding houses and similar occupancies.

Proponent's Reason: Every fixture in a house, including bathtubs and showers, should have a dedicated shutoff valve to facilitate service and replacement of the fixtures without shutting off the water to the whole house or portion of the house.

ITEM 1 (IRC)
Committee Action: Approved as Modified

Modify proposal as follows:

P2903.9.3 Valve requirements. Valves serving individual fixtures, appliances, risers and branches shall be provided with access. An individual shutoff valve shall be required on the fixture supply pipe to each plumbing fixture other than bathtubs and showers.

Committee Reason: The proposed modification further clarifies the location requirements for shutoff valves which does not include bathtubs and shower supply pipes.

Assembly Action: No Motion

ITEM 2 (IPC)
Committee Action: Approved as Submitted

Committee Reason: The proposed text clarifies the location requirements for shutoff valves.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

Public Comment:

David Viola, representing Plumbing Manufacturers Institute, requests Approved as Modified by this comment.

Modify proposal as follows:

IPC 606.2 Location of shutoff valves. Shutoff valves shall be installed in the following locations:

1. On the supply to each plumbing fixture in other than bathtubs and showers in one- and two-family residential occupancies, and other than in individual guestrooms that are provided with unit shutoff valves in hotels, motels, boarding houses and similar occupancies.

Commenter's Reason: Currently, the IPC does not require shut off valves on the water supplies to all fixture fittings in one- and two-family dwellings. The proposal would require a shut off valve on the water supplies to all fixture fittings, regardless of occupancy. The modification is necessary to alleviate a problem on shower valve and tub filler installations. Tub and shower supplies are inaccessible and directly connected to the water distribution system, making it difficult, if not impossible to install shut off valves, unless the faucets were equipped with integral shut off valves. Additionally, the main shut off valve would still have to be used in order to replace these fittings.

The modification is consistent with the language approved by the IRC Plumbing and Mechanical Committee in Code Change Proposal RP28-02, Part 1.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:

<table>
<thead>
<tr>
<th>Item 1</th>
<th>Item 2</th>
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<tr>
<td>AM</td>
<td>AMPC</td>
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<td>Item 1</td>
<td>Item 2</td>
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<td>AS</td>
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</tbody>
</table>

RP31-02

P2904.4.1

Proposed Change as Submitted:

Proponent: Dave W. Cantrell, Snohomish County Planning & Development Services, representing Washington Association of Building Officials

Revise as follows:

P2904.4.1 Water service installation. Trenching, pipe installation and backfilling shall be in accordance with Section P2604. Water-service pipe is permitted to be located in the same trench with a building sewer provided such sewer is constructed of materials listed for underground use within a building in Section P3002.1. If the building sewer is not constructed of materials listed in Section P3002.1, the water-service pipe shall be separated from the building sewer by a minimum of 5 feet (1524 mm), measured horizontally, of undisturbed or compacted earth or placed on a solid ledge at least 12 inches (305 mm) above and to one side of the highest point in the sewer line. Plastic water-service piping shall be approved for termination within 5 feet (1524 mm) inside the point of entry into the building.

THIS PROPOSAL ACHIEVES TECHNICAL CONSISTENCY BETWEEN THE IRC AND IPC. THE FOLLOWING IPC TEXT IS SHOWN FOR INFORMATION PURPOSES ONLY.

605.4 Water service pipe. Water service pipe shall conform to NSF 61 and shall conform to one of the
standards listed in Table 605.4. All water service pipe or tubing, installed underground and outside of the structure, shall have a minimum working pressure rating of 160 psi (1100 kPa) at 73OF (23OC). Where the water pressure exceeds 160 psi (110 kPa), piping material shall have a minimum rated working pressure equal to the highest available pressure. Plastic water service piping shall terminate within 5 feet (1524 mm) inside the point of entry into a building. All ductile iron water pipe shall be cement mortar lined in accordance with AWWA C104.

Proponent’s Reason: This change is consistent with the International Plumbing Code and provides the option to the installer/designer as to whether the point of termination is inside or outside of the building.

Committee Action: Disapproved

Committee Reason: The justification for the proposal lacks technical substantiation and is therefore insufficient to warrant this change.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Dave W. Cantrell, Snohomish County Planning & Development Services, representing Washington Association of Building Officials, requests Approved as Submitted.

Commenter’s Reason: The committee felt that there was insufficient technical justification for allowing plastic water service material to extend within the structure. Yet, this is an approved method of installation per Section 605.4 of the IPC. If such an installation were technically justifiable in the IPC, clearly this would be acceptable for one- and two-family dwellings under the provisions of the IRC.

RM3-02

M1201.1

Proposed Change as Submitted:

Proponent: John Terry, representing the International Existing Building Code Drafting Committee

Revise as follows:

M1201.1 Scope. The provisions of Chapters 12 through 24 shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions within buildings. These chapters shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed in this code. Repairs, alterations, or additions to mechanical systems in existing buildings shall also comply with the International Existing Building Code.

M1202.1 Additions, alterations or repairs. Additions, alterations, renovations or repairs to a mechanical system shall conform to that required for a new mechanical system without requiring the existing mechanical system to comply with all of the requirements of this code. Additions, alterations or repairs shall not cause an existing mechanical system to become unsafe, hazardous or overloaded. Minor additions, alterations or repairs to existing mechanical systems shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system, is not hazardous, and is approved.

Additions, alterations, renovations and repairs to mechanical systems shall comply with the provisions of the International Existing Building Code and this code, as applicable.

SECTION P2502
EXISTING PLUMBING SYSTEMS

P2502.1 Existing building sewers and drains. Existing building sewers and drains shall be used in connection with new systems when found by examination and/or test to conform to the requirements prescribed by this document or the International Existing Building Code.

P2502.2 Additions, alterations or repairs. Additions, alterations, renovations or repairs to any plumbing system shall conform to that required for a new plumbing system without requiring the existing plumbing system to comply with all the requirements of this code. Additions, alterations or repairs shall not cause an existing system to become unsafe, insanitary or overloaded.

Minor additions, alterations, renovations and repairs to existing plumbing systems shall be permitted in the same manner and arrangement as in the existing system, provided that such repairs or replacement are not hazardous and are approved.

Additions, alterations, renovations and repairs to plumbing systems shall comply with the provisions of the International Existing Building Code and this code, as applicable.

SECTION P2603
STRUCTURAL AND PIPING PROTECTION

P2603.1 General. In the process of installing or repairing any part of a plumbing and drainage installation, the finished floors, walls, ceilings, tile work or any other part of the building or premises that must be changed or
replaced shall be left in a safe structural condition in accordance with the requirements of the building portion of this code.

**APPENDIX J**

**EXISTING BUILDINGS AND STRUCTURES**

Delete Appendix J in its entirety.

**Proponent’s Reason:** 1. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.


The proposed code change submitted here is a part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

2. Chapter 25 proposed changes: In Section P2502.1 the International existing Building Code is added to the last sentence as there are instances where the IEBC allows the continued use of existing plumbing systems in conjunction with new plumbing systems without requiring the entire existing plumbing system to comply with provisions for new systems. Text of Section P2502.2 has been deleted and replaced with a reference to the IEBC as the IEBC covers such provisions.

3. Chapter 26 proposed changes: References have been revised to the International Existing Building Code as the IEBC covers topics under sections shown.

4. Appendix J proposed change: Appendix J is proposed to be deleted in its entirety as the IEBC addresses existing buildings and structures.

**Committee Action:** Disapproved

**Committee Reason:** Language that is needed for additions and alterations has been removed from the IRC but not included in the IEBC.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

John Terry, State of New Jersey, representing the IEBC Drafting Committee, requests Approved as Modified by this comment.

Modify proposal as follows:

M1201.1 Scope. The provisions of Chapters 12 through 24 shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions within buildings. These chapters shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed in this code. Repairs, alterations, or additions to mechanical systems in existing buildings shall also comply with the International Existing Building Code.

**SECTION P2502**

**EXISTING PLUMBING SYSTEMS**

P2502.1 Existing building sewers and drains. Existing building sewers and drains shall be used in connection with new systems when found by examination and test to conform to the requirements prescribed by this document or the International Existing Building Code.

P2502.2 Additions, alterations or repairs. Additions, alterations, renovations and repairs to plumbing systems shall comply with the provisions of the International Existing Building Code and this code, as applicable.

**SECTION P2603**

**STRUCTURAL AND PIPING PROTECTION**

P2603.1 General. In the process of installing or repairing any part of a plumbing and drainage installation, the finished floors, walls, ceilings, tile work or any other part of the building or premises that must be changed or replaced shall be left in a safe structural condition in accordance with the requirements prescribe in the building portion of this code.

**APPENDIX J**

**EXISTING BUILDINGS AND STRUCTURES**

Delete Appendix J in its entirety.

**Commenter’s Reason:** This code change was originally Disapproved. The proposed modification simply deletes the part of text in Section M1201.1 which currently appears in section M1201.1 addressing additions, alterations and repairs and its duplication in section M1201.1 is unnecessary. The proposed modification also reverses the reference to the IEBC in Section P2603.1 back to the “building portion of this code” as currently found in the IRC and are addressed in the administrative part of the code by making appropriate reference to the IEBC.

The committee disapproved the code change because: “Language that is needed for additions and alterations has been removed from the IRC but not included in the IEBC.”

The IEBC addresses alterations and additions extensively. Alterations are addressed in three chapters. Chapter 5, 6 and 7 all relate to alterations depending on the extent and the nature of alterations. Additions are addressed in Chapter 9. The IEBC provisions dealing with alterations and additions are far more comprehensive than what is currently in the IRC. Further, the IEBC is complete and is undergoing maintenance of provisions in the 2002 Cycle, just like all the I-codes. In recognition of this fact, the IBC General Committee approved code change proposal G133, that replaces the current text of 2000 IBC Chapter 34, Existing Structures, with a reference to the IEBC. The IEBC Drafting process was very similar to the process used to develop the IBC - a committee developed a draft(s) which was then exposed to the rigors of the ICC Code Development Process. The 2003 IEBC will be part of the 2003 family of International Codes. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings. The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001.

The IEBC Drafting Committee respectfully requests the membership approval of this public comment (AM)
RM6-02
M1501.2

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Fairfax County, VA, representing Virginia Plumbing and Mechanical Inspectors Association

Revise as follows:

M1501.2 Exhaust duct size. The minimum diameter of the exhaust duct shall be as recommended by the clothes dryer's listing and the manufacturer's installation instructions, and shall be at least the diameter of the appliance outlet.

Proponent's Reason: The current text leads the user to believe that the manufacturer's recommendations are a minimum and exhaust duct sizes can be increased. This new language says what is meant, follow the manufacturer's recommendations.

Committee Action: Disapproved

Committee Reason: The proposed change removes the flexibility to increase duct size when the maximum length cannot be met.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors Association, requests Approved as Submitted.

Commenter's Reason: The committee's reason for disapproval was that this proposal removes the option to increase the duct size when the maximum distance must be exceeded. This is invalid since the code and appliance manufacturer's instructions do not currently allow a duct size increase.

This proposed text fixes a defective code section. It is often interpreted that when the installation of clothes dryer exhaust duct, as prescribed by the dryer manufacturer, cannot be achieved, then it is ok to simply oversize the duct and the maximum distances become irrelevant. The dryer manufacturers have their appliances listed and labeled. The installation instructions are part of this process. It cannot be common practice to violate a product installation requirement based on a misconception that has arisen from current language. When the product manufacturers specify a particular size and maximum distance, that is exactly what must be installed. The dryer's effectiveness to deliver the exhaust to the outdoors is developed by the testing that has been performed and the identified limits are contained in the installation instructions. Installations must not go beyond what the manufacturers permit.

RM7-02
M1501.3

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Fairfax County, VA, representing Virginia Plumbing and Mechanical Inspectors Association

Revise as follows:

M1501.3 (Supp) Length limitation. The maximum length of a clothes dryer exhaust duct shall not exceed 25 feet (7620 mm) from the dryer location to the wall or roof termination. The maximum length of the duct shall be reduced 2.5 feet (762 mm) for each 45-degree (0.79 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

Exception:

1. Where a clothes dryer booster fan is installed and listed and labeled for the application, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the booster fan manufacturer's installation instructions. Where a clothes dryer booster fan is installed and not readily accessible from the room in which the dryer is located, a permanent identifying label shall be placed adjacent to where the duct enters the wall. The label shall bear the words “this dryer exhaust system is equipped with a remotely located boosterfan”.

2. Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for such dryer are provided to the building official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instruction.

This proposal achieves technical consistency between the IRC and the IMC. The following IMC text is shown for information purposes only.

504.6.1 (Supp) Maximum length. The maximum length of a clothes dryer exhaust duct shall not exceed 25 ft (7620 mm) from the dryer location to the outlet terminal. The maximum length of duct shall be reduced 2 ½ feet for each 45-degree (0.79 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

(Exception unchanged)
**Propponent’s Reason:** The new exception to the IRC created a large conflict within the ICC codes. The IMC committee disapproved this very same item. The conflict this new section created is that all equipment shall be listed and labeled per Section M1302.1, and installed per such listing, this includes the clothes dryer. See Section R102.4 Referenced codes and standards. This is clearly what this section was written for. The installation of a booster fan on an installation of a listed clothes dryer exhaust system is a VIOLATION of the clothes dryer listing. NO clothes dryer manufacturers have incorporated these fans into their listing. Common code language is “when an item is listed it shall be installed in accordance with its listing and the manufacturer’s installation instructions” one thought! This new section states this requirement in two separate thoughts, one is it’s listed, which in this case, it’s simply listed as a fan. The second thought is it shall be installed in accordance with the fan manufacturer’s installation instructions. This is because its listing does not include the requirements for installing these fans on another manufacturer’s listed clothes dryer exhaust system. In the event of an exhaust duct fire, who will be responsible, the dryer manufacturer or the fan booster manufacturer? This has been a terrible mistake; these systems need to be approved in accordance with Section R104.11 Alternative materials, design and methods of construction and equipment, on a case-by-case, hardship basis. Taking advantage of the other stated exception to this section will give the designers and installers the relief necessary for a custom installation that exceeds 25 feet, using the dryer manufacturer’s installations recommendations!

The label issue is unenforceable and completely useless. How will it be permanent? Who will ever see it 6 to 8 inches off the floor, behind a dryer where the duct enters the wall? If a second homeowner happens to see it, will they know what it means? This is the opportunity to correct a huge conflict within our code. This exception is beyond the guidelines of good practice, stated in the purpose of this code, Section R101.3. A new home buyer should not have to worry about any unnecessary mechanical failures, labels, accessibility for these fans, and other situations caused by these fans, when the code already offers more fail-safe minimum standard features at less cost and hazard.

**Committee Action:** Disapproved

**Committee Reason:** Booster fans are a viable alternative and should be left in the code.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors Association, requests Approved as Submitted.

**Commenter’s Reason:** This text promotes a violation of clothes dryer listing and labeling. No clothes dryer manufacturers recommend these systems within their installation instructions as an accessory to their product. No interlock to the dryer is assured by this text. No means of assurance is provided that these systems are maintained, serviced, or cleaned. In no way have these systems shown the same minimum level of safety that an exhaust duct system installed per the manufacturer’s installation instructions provide. A safe built environment is what is expected of the code and this provision in no way offers this minimum level of equivalent protection. These systems offer added cost to construction and then assume that an owner wants the added responsibility of maintenance. The excessive distances these systems promote are difficult to access for cleaning and when this situation occurs, it is typically “out of sight out of mind” for the average owner, until a problem occurs. This may lead to lint accumulation which is a hazard. The requirement of labeling serves very little, if any, usefulness in this application. The average owner will not understand the circumstances they are faced with when they see these labels. The label could be obscured a short time after original occupancy.

**RM8-02 M1506.4**

**Proposed Change as Submitted:**

**Proponent:** Rene' Beliveau and Guy McMann, City of Golden Building Division and Jefferson County Building Department, representing Colorado Association of Plumbing and Mechanicals Officials

Add new text as follows:

**M1506.4 Bathroom exhaust termination.** Exhaust systems shall discharge directly to the outdoors terminating not closer than 3 feet to property lines and openings into the building. Terminations shall be equipped with a backdraft damper.

**Proponent’s Reason:** Currently the IRC makes no mention of where environmental air ducts are to terminate. IMC Section 502.6.3.6 does address environmental exhaust termination. Packaging these requirements in this section is logical and appropriate for the subject matter and intended use. While Section M1506.2 does define the intent that exhaust air should not be recirculated within a residence or to another dwelling, it, by itself, is too performance based for a code that was designed to be highly prescriptive. Without this additional language, enforcement of this requirement will lead to confusion and arbitrary and inconsistent enforcement.

**Committee Action:** Disapproved

**Committee Reason:** This change would be in conflict with RM1-02. There are some exhaust fans that have built-in backdraft dampers at the fan.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment**

Judson W. Collins, Oklahoma State Health Department, Health Facilities Plan Review, requests Approved as Modified by this comment.

**Modify proposal as follows:**

**M1506.4 Bathroom exhaust termination.** Exhaust systems shall discharge directly to the outdoors terminating not closer than 3 feet to property lines and openings into the building. Terminations shall be
equipped with a backdraft damper. Backdraft dampers shall be integral with the exhaust fan unit or the exhaust duct termination.

Commenter’s Reason: The committee stated that RM8-02 would conflict with RM1-02, which is not correct. Section R303.4 of RM1-02 would be a conflict but was deleted by the committee. Section R303.4.1 is not a conflict because dwelling unit bathroom exhaust is stated as NOT being hazardous or noxious. Without the text of RM8-02, there is no text in the IRC to regulate the distance between bathroom exhaust and intake openings into buildings. This gap needs to be fixed before the 2003 edition. Also, the exception to Section R303.3 is the only place in the IRC that states that such exhaust must discharge to the outdoors. Therefore, this text is needed to make the intent clear that the bathroom exhaust must discharge to the outdoors. The revised last sentence takes care of the committee’s other concern for dampers.

RM10-02
M1601.3.1

Proposed Change as Submitted:

Proponent: John Herzog, representing Air Conditioning Contractors of America

Revise as follows:

M1601.3.1 Joints and seams. Joints of duct systems shall be made substantially airtight by means of tapes, mastics, gasketing or other approved closure systems. Closure systems used with fibrous glass ducts shall comply with UL 181 A and shall be marked “181A-P” for pressure sensitive tape, “181 A-M” for mastic or “181 A-H” for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181 B and shall be marked 181 B-FX for pressure-sensitive tape or 181 B-M for mastic. Duct connections to flanges of air distribution system equipment or sheet metal fittings shall be mechanically fastened. Crimp joints for round metal ducts shall have a contact lap of at least 1.5 inches (38 mm) and shall be mechanically fastened by means of at least three sheet metal screws or rivets spaced at least 90 degrees apart around the joint.

Proponent’s Reason: The “three” screw requirement, while appropriate for flexible ducts and connectors according to SMACNA HVAC Duct Construction Standards, is covered elsewhere. The “three” screw requirement may be excessive for round metal ducts when also requiring 1.5 inch contact lap and support in accordance with M1601.3.2, not to mention impractical, if not impossible, to satisfy in applications where the round metal duct is being installed parallel to the floor joist, between the joist, and just below the floor. In this application, two screws are sufficient for joining the round metal ducts with 1.5 inch contact laps.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason. It is not always feasible to install 3 screws in a confined space.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment

Judson W. Collins, Oklahoma State Health Department, Health Facilities Plan Review, requests Approved as Modified by this comment.

Modify proposal as follows:

M1601.3.1 Joints and seams. Joints of duct systems shall be made substantially airtight by means of tapes, mastics, gasketing or other approved closure systems. Closure systems used with fibrous glass ducts shall comply with UL 181 A and shall be marked “181A-P” for pressure sensitive tape, “181 A-M” for mastic or “181 A-H” for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181 B and shall be marked 181 B-FX for pressure-sensitive tape or 181 B-M for mastic. Duct connections to flanges of air distribution system equipment or sheet metal fittings shall be mechanically fastened. Crimp joints for round metal ducts shall have a contact lap of at least 1.5 inches (38 mm) and shall be mechanically fastened by means of at least two sheet metal screws or rivets spaced at least 90 degrees apart around the joint.

Commenter’s Reason: As currently worded, the two fasteners could be placed any distance apart including 1/4 inch. The intent is to space the fasteners as far apart as the conditions will permit. Current code requires a spacing of 120 degrees and the proposed 90 degrees is a reasonable and attainable compromise.
P1-02

101.2 Scope

The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems within this jurisdiction. The installation of fuel gas distribution piping and equipment, fuel gas-fired water heaters, and water heater venting systems shall be regulated by the International Fuel Gas Code. Plumbing systems in existing buildings undergoing repair, alteration, addition, and change of occupancy shall also comply with the International Existing Building Code.

SECTION 102

APPLICABILITY

102.4 Additions, alterations or repairs. Additions, alterations, renovations or repairs to any plumbing system shall conform to that required for a new plumbing system without requiring the existing plumbing system to comply with all the requirements of this code. Additions, alterations or repairs shall not cause an existing system to become unsafe, insanitary or overloaded.

Minor additions, alterations, renovations and repairs to existing plumbing systems shall be permitted in the same manner and arrangement as in the existing system, provided that such repairs or replacement are not hazardous and are approved.

Additions, alterations, renovations and repairs to plumbing systems shall comply with the provisions of the International Existing Building Code and this code, as applicable.

102.5 Change in occupancy. It shall be unlawful to make any change in the occupancy of any structure that will subject the structure to any special provision of this code without approval of the code official. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new occupancy and that such change of occupancy does not result in any hazard to the public health, safety or welfare. The provisions of the International Existing Building Code shall apply to change of occupancy.

102.6 Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings. The provisions of the International Existing Building Code shall apply to historic buildings.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the International Building Code, International Fire Code, ICC Electrical Code, International Fuel Gas Code, or the International Mechanical Code or the International Existing Building Code, such terms shall have the meanings ascribed to them as in those codes.

307.1 General. In the process of installing or repairing any part of a plumbing and drainage installation, the finished floors, walls, ceilings, tile work or any other part of the building or premises that must be changed or replaced shall be left in a safe structural condition in accordance with the requirements of the International Existing Building Code.

PropONENT'S REASONS:

Reason: 1. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.


The proposed code change submitted here is a part of a larger package of code changes submitted to all international Codes for coordination and correlation with the International Existing Building Code.

2. 101.2: The reference to repair, alteration, etc. in the first and second lines remain because there are still certain sections dealing with these subject present in the IPC. These sections remain in the IPC for plumbing professionals ease of access to such information. The last sentence related to existing buildings undergoing repairs, alterations, etc. and the reference to the IEBC is needed to refer the code user to plumbing requirements that might be triggered as a result of work performed under the jurisdiction of the IEBC. An example would be IEBC Section 610.1 where in buildings undergoing “Alterations Level 2” the number of plumbing fixtures might need to be increased. The IEBC chapters have a cascading effect such that IEBC Section 610.1 is also applicable to buildings undergoing “Alterations Level 3” and “Change of Occupancy Classification”.

3. 102.4: The IEBC addresses plumbing issues related to additions, alterations and repairs. The IEBC Drafting Committee after extensive discussions agreed on the goal that existing building provisions while providing for health and safety should also encourage the use and reuse of existing buildings. Accordingly Sections 401.2, 401.3, 410 (Repair), 501.2, 503.3 (Alteration level 1), 601.2, 610 (Alteration level...
2), 701.2 (Alteration level 3), and 901.1 (Additions) address such
issues. Please note that the terms, “Addition”, “Alteration” and “Repair”
are not defined in the IPC.

4. 102.5 : This section is revised to make reference to the IEBC. The
IEBC contains comprehensive provisions for change of occupancy.

5. 102.6 : This section is revised to make reference to IEBC. The IEBC
contains comprehensive provisions for historic buildings.

6. 201.3 : The International Existing Building Code is added as many
terms related to existing buildings such as those discussed under 102.4
are found in the IEBC.

7. Section 307.1 : Any change or modification to walls, floors, ceiling
and other building elements as a result of plumbing work, will create a
category of work under the provisions of the IEBC and therefore a
reference to the IEBC is needed to alert the code user to the possibility
of requirements that might be triggered under the IEBC.

Committee Action: Disapproved

Committee Reason: The proposed text would reference the IEBC that
is in the final draft stage and should reference the IBC because of
conflicting sections between the two codes. In addition, the IEBC
conflicts with Section 105.2 and 403.1 of the IPC.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual
consideration because a public comment was
submitted.

Public Comment:

John Terry, State of New Jersey, representing the
IEBC Drafting Committee, requests Approved as
Modified by this comment.

Modify proposal as follows:

101.2 Scope. The provisions of this code shall apply to the erection,
installation, alteration, repairs, relocation, replacement, addition to,
use or maintenance of plumbing systems within this jurisdiction. The
installation of fuel gas distribution piping and equipment, fuel gas-fired
water heaters, and water heater venting systems shall be regulated by
the International Fuel Gas Code.

Plumbing systems in existing buildings undergoing repair, alteration,
addition and change of occupancy shall also comply with the
International Existing Building Code.

SECTION 102
APPLICABILITY

102.4 Additions, alterations or repairs. Additions, alterations,
renovations and repairs to plumbing systems shall comply with the
provisions of the International Existing Building Code and this code, as
applicable.

102.5 Change in occupancy. The provisions of the International
existing Building Code shall apply to change of occupancy.

102.6 Historic buildings. The provisions of the International existing
Building Code shall apply to historic buildings.

201.3 Terms defined in other codes. Where terms are not defined in
this code and are defined in the International Building Code,
International Fire Code, ICC Electrical Code, International Fuel Gas
Code, the International Mechanical Code or the International Existing
Building Code, such terms shall have the meanings ascribed to them
as in those codes.

307.1 General. In the process of installing or repairing any part of a
plumbing and drainage installation, the finished floors, walls, ceilings,
tile work or any other part of the building or premises that must be
changed or replaced shall be left in a safe structural condition in
accordance with the requirements of the International Existing
Building Code.

Commenter’s Reason: This code change was originally Disapproved.
The proposed modification simply deletes the part of text in Section 101.2 which currently appears in Section 102.4 addressing additions,
alterations and repairs and its duplication in Section 101.2 is
unnecessary. Section 102.6 Historic Buildings has been deleted as
historic buildings are existing buildings and covered under the IEBC.
The revisions shown in Section 307.1 incorporate submitted revisions
on the floor of the committee hearings in Pittsburgh. This revision
keeps the reference to the IBC, and the administrative sections of the
code make proper reference to the IEBC for repair.

Contrary to the reported reason for Disapproval, the IEBC is, in fact,
complete and is undergoing maintenance of provisions in the 2002
Cycle, just like all the I-codes. In recognition of this fact, the IBC
General Committee approved code change proposal G133, that
replaces the current text of 2000 IBC chapter 34, Existing Structures,
with a reference to the IEBC. The IEBC Drafting process was very
similar to the process used to develop the IBC - a committee developed
a draft(s) which was then exposed to the rigors of the ICC Code Development Process. The 2003 IEBC will be part of the 2003 family
of International Codes. The ICC Board of Directors established the
IEBC Drafting Committee and charged it with the responsibility of
drafting a code to have comprehensive provisions for existing buildings. The International Existing Building Code (IEBC), 2003 Final Draft, was

There were similar code changes proposed to the IBC for coordination
with the IEBC that should eliminate any conflicts between the two
codes, even though the committee did not provide specifics related to
conflicts between the IEBC and IBC. There is no conflict between the
IEBC and IPC Section 105.2. In fact the IEBC Section 104.11 (which
is the same as the IBC Section 104.11) is the same as the IPC Section
105.2. The IPC Section 403.1 deals with the minimum number of
plumbing fixtures. The IEBC requires the fixture count requirements of
the IPC be complied with if the occupant load of any story is increased
by more than 20 percent due to an alteration (IEBC Section 610) and
requires fixture counts based on the IPC in a change of occupancy if
the new occupancy requires more fixtures (IEBC Section 610). These
requirements are certainly not a conflict with the IPC and in the case of
alterations, there is only an additional flexibility provided in the IEBC.

The IEBC Drafting Committee respectfully requests the membership
approval of this public comment (AM)

P5-02
202 (IRC R202)
Proposed Change as Submitted:
**Proponent:** James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association & Virginia Building Code Official Association

**THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**

Revise as follows:

1. **IPC BUILDING DRAIN.** That part of the lowest piping of a drainage system that receives the discharge from soil, waste and other drainage pipes inside and that extends 30 inches (762 mm), measured along the length of pipe, beyond the exterior walls of the building and conveys the drainage to the building sewer.

2. **IRC BUILDING DRAIN.** The lowest piping that collects the discharge from all other drainage piping inside the house and conveys it to the building sewer extends 30 inches (762 mm) outside the building wall, measured along the length of pipe, beyond the exterior walls and conveys the drainage to the building sewer.

**Proponent’s Reason:** The 30 inch extension of building drain to the outside has been causing some confusion for the installation of clean outs at the building drain and building sewer junction. This proposed change will clarify the intent of the code.

**ITEM 1 (IPC)**

Committee Action: Approved as Modified

Modify proposal as follows:

IPC BUILDING DRAIN. That part of the lowest piping of a drainage system that receives the discharge from soil, waste and other drainage pipes inside and extends 30 inches (762 mm) in developed length of pipe, beyond the exterior walls of the building and conveys the drainage to the building sewer.

Committee Reason: The modification further clarifies the definition of a building drain which extends 30 inches in developed length of pipe beyond the exterior walls of the building.

Assembly Action: No Motion

**ITEM 2 (IRC)**

Committee Action: Approved as Modified

Modify proposal as follows:

IRC BUILDING DRAIN. The lowest piping that collects the discharge from all other drainage piping inside the house and extends 30 inches (762 mm) in developed length measured along the length of pipe beyond the exterior walls and conveys the drainage to the building sewer.

Committee Reason: The modification further clarifies the definition of a building drain which extends 30 inches in developed length beyond the exterior walls of the building.

Assembly Action: No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Steve Yunker, City of Hendersonville, TN, requests Approved as Modified by this comment.

Modify proposal as follows:

1. **IPC BUILDING DRAIN.** That part of the lowest piping of a drainage system that receives the discharge from soil, waste and other drainage pipes inside and that extends 30 inches (762 mm) in developed length of pipe, beyond the exterior walls of the building and conveys the drainage to the building sewer.

2. **IRC BUILDING DRAIN.** The lowest piping that collects the discharge from all other drainage piping inside the house and conveys it to the building sewer extends 30 inches (762 mm) in developed length of pipe, beyond the exterior walls and conveys the drainage to the building sewer.

Commenter’s Reason: The modification is needed to correlate the IRC with the change that was approved by the IPC committee and to clarify the IRC language.

**P9-02**

202

**Proposed Change as Submitted:**

**Proponent:** Patrick J. Higgins, P.J. Higgins & Associates, Inc.

Revise as follows:

**PLUMBING.** The practice, materials and fixtures utilized in the installation, maintenance, extension and alteration of all piping, fixtures, plumbing appliances and plumbing appurtenances, within or adjacent to any structure, in connection with sanitary drainage or storm drainage facilities; venting systems; public or private water supply systems; and sanitary and condensate vacuum collection systems.

**PLUMBING SYSTEM.** Includes the water supply and distribution pipes; plumbing fixtures and traps; water-treating or water-using equipment; soil, waste and vent pipes; sanitary and storm sewers and building drains; and sanitary and condensate vacuum collection systems in addition to their respective connections, devices and appurtenances within a structure or premises.

**Proponent’s Reason:** Vacuum sanitary systems are being installed
in a variety of locations such as prisons. Vacuum condensate collection systems are being installed in supermarkets to collect the discharges from refrigeration cases. Appendix G of this code identifies that vacuum collection systems are defined as part of "plumbing".

**Analysis:** Consistent action should be considered for related proposal P2-02.

**Committee Action:** Approved as Submitted

**Committee Reason:** To include an appropriate reference to vacuum sanitary and condensate systems in the definition of plumbing which is in the scope of both systems.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association/Virginia Building Code Officials Association, requests Approved as Modified by this comment.

Modify proposal as follows:

**PLUMBING.** The practice, materials and fixtures utilized in the installation, maintenance, extension and alteration of all piping, fixtures, plumbing appliances and plumbing appurtenances, within or adjacent to any structure, in connection with sanitary drainage or storm drainage facilities; venting systems; and public or private water supply systems; and sanitary and condensate vacuum collection systems.

**PLUMBING SYSTEM.** Includes the water supply and distribution pipes; plumbing fixtures and traps; water-treating or water-using equipment; soil, waste and vent pipes; sanitary and storm sewers and building drains; and sanitary and condensate vacuum collection systems in addition to their respective connections, devices and appurtenances within a structure or premises.

Modify current text as follows:

**101.2 Scope.** The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems within this jurisdiction. This code shall also regulate sanitary and condensate vacuum collection systems. The installation of fuel gas distribution piping and equipment, fuel gas-fired water heaters, and water heater venting systems shall be regulated by the *International Fuel Gas Code*.

**Commenter’s Reason:** This modification does not change the proponent’s intent, it is simply placing the proponent’s language in the proper location. P9-02 proposed to add a specific type of plumbing system into the general definition of “PLUMBING” and “PLUMBING SYSTEM”. A definition is not the appropriate location for a laundry list. Section 101.2 “SCOPE” is where this language should be. P2-02 was recommended for Approval and has the same approach for adding medical gas and vacuum systems to the scope instead of to the definition.

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**P12-02**

**301.3 (IRC P2601.2)**

**Proposed Change as Submitted:**

**Proponent:** James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association & Virginia Building Code Official Association

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. **IPC 301.3 Connections to the sanitary drainage system.** All plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent the indirect waste systems required by Chapter 8.

2. **IRC P2601.2 Connection.** Plumbing fixtures, drains and appliances used to receive or discharge liquid wastes or sewage shall be connected to the sanitary drainage system of the building or premises in accordance with the requirements of this code. This section shall not be constructed to prevent indirect waste systems.

**Proponent’s Reason:** The definition of drainage system includes the storm drainage system also and this section of code obviously has nothing to do with storm drains. This change is to prevent any misapplication of this code section.

**ITEM 1 (IPC)**

**Committee Action:** Disapproved

**Committee Reason:** The proposed text does not clarify the intent of this section and is already included in the definition of sanitary drainage system located in Chapter 2.

**Assembly Action:** No Motion

**ITEM 2 (IRC)**

**Committee Action:** Approved as Submitted

**Committee Reason:** The proposed text provides further clarification that all plumbing fixtures, drains, appliances must be connected to the sanitary drainage system.

**Assembly Action:** Disapproved-Motion Failed

**Individual Consideration Agenda**
This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

Public Comment:

Charles E. Gerber, Henrico County, VA, representing Virginia Plumbing and Mechanical Inspectors Association/Virginia Building Code Officials Association, requests Approved as Submitted for Items 1 and 2.

Commenter's Reason: The committee’s reason is exactly the same reason I used. The term currently used in this code section is “drainage system”, and by definition, this includes storm. This section of code is referring to the connections that convey “liquid wastes or sewage”, which is by definition sanitary drainage system only. By approving this, as the IRC Committee did, you are correctly identifying what the IPC Committee is agreeing with in their reason for disapproval.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:

<table>
<thead>
<tr>
<th>Item 1</th>
<th>Item 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Item 1 AS</td>
<td>Item 2 AS</td>
</tr>
</tbody>
</table>

P19-02

310.5

Proposed Change as Submitted:

Proponent: James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association & Virginia Building Code Official Association

Add new text as follows:

310.5 Urinal compartment. Each urinal utilized by the public or employees shall be provided with side walls or partitions for privacy.

Exceptions: Urinal compartments shall not be required in a single-occupant toilet room with a lockable door.

Proponent's Reason: The proposed change will provide guidance for urinal privacy partitions.

Committee Action: Disapproved

Committee Reason: The justification for the additional costs of the partitions lacks technical substantiation and is therefore insufficient to warrant this change.

Assembly Action: Approved as Submitted

P22-02

314.1

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Fairfax County, VA, representing Virginia Plumbing and Mechanical Inspectors Association & Virginia Building Code Official Association

Delete and substitute as follows:

314.1 Fuel-burning appliances. Liquid combustion by-products of condensing appliances shall be collected and discharged to an approved plumbing fixture or disposal area in accordance with the manufacturer's installation instructions. Condensate piping shall be of approved corrosion-resistant material and shall not be smaller than the drain connection on the appliance. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one-eighth unit vertical in 12 units horizontal (1-percent slope).

314.2 Evaporators and cooling coils. Condensate drain systems shall be provided for equipment and
appliances containing evaporators or cooling coils. Condensate drain systems shall be designed, constructed and installed in accordance with 314.2.1 through P314.2.3.

314.2.1 Condensate disposal. Condensate from all cooling coils and evaporators shall be conveyed from the drain-pan outlet to an approved place of disposal. Condensate shall not discharge into a street, alley or other area so as to cause a nuisance.

314.2.2 (Supp) Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC, or PVC pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Condensate waste and drain line size shall not be less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method. All horizontal sections of drain piping shall be installed in uniform alignment at a uniform slope.

314.2.3 Auxiliary and secondary drain systems. In addition to the requirements of 314.2.1, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Metallic pans shall have a minimum thickness of not less than 0.0276-inch (0.7 mm) galvanized sheet metal. Non-metallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).

2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.

3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water level detection device that will shut off the equipment served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.

314.2.4 Traps. Condensate drains shall be trapped as required by the equipment or appliance manufacturer.

314.1 General. Condensate disposal shall comply with the International Mechanical Code.

Proponent's Reason: Condensate disposal is a mechanical issue; condensate is created by mechanical equipment. The family of International codes need to work together in a common format. It is proper to reference other ICC Codes. The International Mechanical Code and the International Plumbing Code routinely reference the International Fuel Gas Code.

If we were to have dual coverage within the ICC Codes, we need to look at all sections where plumbing, fuel-gas, and mechanical systems share common ground and duplicate each and every section in each code. For example, an installer who may be mainly familiar with the plumbing code may choose to install hydronic piping, so under the dual coverage logic, we would need to duplicate Chapter 12 of the International Mechanical Code in the International Plumbing Code. What about boilers, Chapter 10 of the International Mechanical Code? The same conditions exist. The list could go on and on for areas that plumbing, fuel-gas and mechanical systems share common interest. We need to allow the codes to work together. This is simply bad formatting. If a code change is submitted and approved in one document and not the other, what happens? Which one would be correct? Leaving this coverage in the plumbing code is setting up the international codes need to work together in a common format. It is proper to reference other ICC Codes. The International codes need to work together in a common format. It is proper to reference other ICC Codes. The International Fuel Gas Code.

Committee Action: Disapproved

Committee Reason: Current text should not be deleted, because plumbers usually install condensate piping, however, this section should be heard by the IMC Committee and duplicated in the IPC.

Assembly Action: No motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Jim Ranfone, representing the American Gas Association requests Approved as Modified by this comment.

Modify proposal as follows:

314.1 General. Condensate disposal shall comply with the International Mechanical Code and for fuel gas condensate disposal, the International Fuel Gas Code.
Commenter's Reason: Condensate disposal is a mechanical issue and adequate coverage is found in the International Mechanical Code for condensate generated by refrigerant systems. The International Fuel Gas Code has the appropriate coverage for condensate disposal of condensate generated by fuel gas applications. Therefore, the IFGC also needs to be referenced in the IPC. Having coverage in the IPC that duplicates text has the potential to create conflicts and can result in confusion and enforcement problems in the field.

Public Comment 2:

Guy Tomberlin, Fairfax County, VA, representing Virginia Plumbing and Mechanical Inspectors Association, requests Approved as Submitted.

Commenter's Reason: It is common format for any single code, contained within the family of ICC codes, to reference another for items of technical prescription. Condensate is no different; it is not an item that is any more or less important than any other contained in the Mechanical Code. It needs to be covered in the Mechanical Code alone because condensate is produced from mechanical equipment! This will allow the International Codes to work with each other. It is virtually impossible for one code book to cover a complete installation of any type. For example, after all the plumbing and mechanical issues are addressed in relation to an appliance installation, what about all of the building, energy, or the electrical code issues? If condensate coverage is to remain in both codes then it would appear, in order to maintain consistency in formatting, we will then have to begin transferring all the Building, Energy and Electrical Code sections into the Plumbing and Mechanical Codes (structural loading, fire ratings, types of construction, energy efficiency ratings, conductor sizes, grounding requirements, etc..). The list never ends.

This selective duplication is poor formatting and not consistent with the concept of all the International Codes working together in order to achieve a code compliant, safe, built environment.

P23-02
T. 403.1

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Fairfax County, VA, representing Virginia Plumbing and Mechanical Inspectors Association & Virginia Building Code Official Association

Delete and substitute as follows:
### TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES
(see Sections 403.2 and 403.3)

<table>
<thead>
<tr>
<th>No.</th>
<th>Classification</th>
<th>Use Group</th>
<th>Description</th>
<th>Water Closets (Urinals see Section 419.2)</th>
<th>Lavatories (see Section 410.1)</th>
<th>Bath/Shower</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>2</td>
<td>Business (see Section 403.2, 403.4 and 403.5)</td>
<td>B</td>
<td>(No change)</td>
<td>†per 50 1 per 25 for first 150 occupants and 1 per 50 for remaining occupants exceeding 150</td>
<td>†per 80 1 per 40 for first 150 occupants and 1 per 80 for remaining occupants exceeding 150</td>
<td>1 per 100</td>
<td>--------</td>
</tr>
</tbody>
</table>

(No change to remainder of table)

**Proponent's Reason:** In the 1999 cycle the fixture requirement in Business occupancies was changed from 1 per 25 to 1 per 50 for water closets and 1 per 40 to 1 per 80 for lavatories. This change is creating a shortage in the number of bathroom facilities in many areas. During peak usage times, as well as other various times, this reduction of fixtures is allowing business to fall short of providing ample amount of plumbing fixtures. People have to wait in line in order to use facilities the code was intended to provide for.

**Committee Action:** Disapproved

**Committee Reason:** The justification for the proposal lacks technical substantiation and is therefore insufficient to warrant this change.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Charles E. Gerber, Henrico County, VA, representing Virginia Plumbing and Mechanical Inspectors Association/Virginia Building Code Officials Association, requests Approved as Modified by this comment.

Modify proposal as follows:
TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES
(see Sections 403.2 and 403.3)

<table>
<thead>
<tr>
<th>No.</th>
<th>Classification</th>
<th>Use Group</th>
<th>Description</th>
<th>Water Closets (Urinals see Section 419.2)</th>
<th>Lavatories</th>
<th>Drinking Fountains (see Section 410.1)</th>
<th>Bath/Shower</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>1 per 100</td>
</tr>
<tr>
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<td>Business (see Section 403.2, 403.4 and 403.5)</td>
<td>B (No change)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(No change to remainder of table)

Commenter’s Reason: The code change for required water closets and lavatories in the 1999 cycle allowed twice as many people to be served by one water closet and one lavatory. This has created fewer water closets and lavatories, which will result in lines to use the facility. In smaller tenant spaces up to an occupant load of 100, there would only be a requirement for two water closets, one mens and one womens. This is what this change is specifically proposing to fix. The approval of this change will allow the occupants at least two water closets.

P31-02
403.6.2

Proposed Change as Submitted:

Proponent: Mike Brady, representing the Ohio Board of Building Standards

Revise as follows:

403.6.2 Pay facilities. Required facilities shall be free of charge and designated by legible signs for each sex. Where pay facilities are installed, such facilities shall be in excess of the required minimum facilities. Required facilities shall be free of charge.

403.7 Signage. A legible sign designating the sex shall be provided in a readily visible location near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with ICC/ANSI A117.1.

Reason: It doesn’t make any sense to hide the requirement for signs in the “Pay facilities” section. It should be in a readily visible section identified for that purpose. This section is very similar to existing Section 404.2.6. A corresponding change is being submitted for Chapter 29 of the International Building Code.

Analysis: Consistent action should be considered for related proposals P25-02 and P27-02.

Committee Action: Approved as Modified

Modify proposal as follows:

403.6.2 Pay facilities. Where pay facilities are installed, such facilities shall be in excess of the required minimum facilities. Required facilities shall be free of charge.

403.7 Signage. Facilities shall be designated by a legible sign for each sex. Signs shall be readily visible and located near the entrance to each toilet facility. A legible sign designating the sex shall be provided in a readily visible location near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with ICC/ANSI A117.1. Signs for accessible toilet facilities shall comply with ICC/ANSI A117.1.

Committee Reason: The modification provides additional requirements and clarification for signage in all toilet facilities.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lawrence G. Perry, AIA, representing BOMA International, requests Approved as Modified by this comment.

Modify proposal as follows:

(No change to Section 403.6.2)

403.7 Signage. Required public facilities shall be designated by a legible sign for each sex. Signs shall be readily visible and located near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with ICC/ANSI A117.1.

Commenter’s Reason: “Required” is added to the first sentence so that toilet facilities provided within an executive office, in excess of the required fixtures, need not have a sign. The President already knows which door in the Oval Office is his private toilet room.

“Public” is added to the first sentence so that dwelling unit and hotel guest room toilet facilities need not have a sign. The last sentence referencing A117 is deleted for two reasons. First, as written it appears to address both the identification sign and any directional signage that might be provided. A117.1 provides different categories of technical sign criteria; without specifying the type of “accessible” sign required (visual only, or visual and tactile) the reference is incomplete and is unenforceable. Second, the scoping...
requirements for both directional signs and for “permanent designation” signs are contained in an appendix chapter of the IBC, as it was determined that these provisions exceed what has historically been regulated by building codes. If a jurisdiction chooses to adopt and enforce the IBC appendix provisions for accessible signage, the first sentence of the new 403.7 will require a sign, which will then be regulated as a “permanent designation” of the toilet room. If a jurisdiction decides it lacks a mechanism to regulate general building signage, and chooses not to use the IBC appendix, there will be no mechanism to enforce the sign provisions (which through the reference to A117 are very technical) in the IPC.

P32-02
405.3.1 (IRC P2705.1)

Proposed Change as Submitted:

Proponent: James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association & Virginia Building Code Officials Association

THIS PROPOSAL IS ON THE AGENDA OF THE IPC
AND THE IRC PLUMBING CODE DEVELOPMENT
COMMITTEES. SEE THE TENTATIVE HEARING
ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IPC 405.3.1 (Supp) Water closets, lavatories and bidets. A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction, or closer than 30 inches (762 mm) center–to–center between water closets and adjacent fixtures. A lavatory shall not be set closer than 12 inches (305 mm) from its center to any side wall, partition or other obstruction, for a corner type lavatory this clearance shall be measured from the front edge of the lavatory to either side wall. There shall be at least 21 inches (533 mm) clearance in front of the water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall not be less than 30 inches (762 mm) wide or 60 inches (1524 mm) deep. There shall be at least 21 inches (533 mm) clearance in front of a lavatory to any wall, fixture or door (see Figure 405.3.1).

2. IRC P2705.1 (Supp) General. The installation of fixtures shall conform to the following:

(No change to items 1 - 4)

5. The center line of water closets or bidets shall not be less than 15 inches (381 mm) from adjacent walls or partitions or not less than 15 inches (381 mm) from center line of a bidet to the outermost rim of an adjacent water closet. A lavatory shall not be set closer than 12 inches (305 mm) from its center to any side wall, partition or other obstruction, for a corner type lavatory this clearance shall be measured from the front edge of the lavatory to either side wall. There shall be at least 21 inches (533 mm) clearance in front of the water closet, bidet or lavatory to any wall, fixture or door.

(No change to Items 6 and 7)

Proponent’s Reason: 24 inch lavatory and vanity tops and corner type lavatories are commonly used. The proposed change will allow their installation and it will provide some guidance for their installation.

Analysis: The proponent does not define the front edge of a lavatory or a corner type lavatory.

ITEM 1 (IPC) Committee Action: Disapproved

Committee Reason: The IPC committee prefers existing code language and the additional text is not necessary.

Assembly Action: No Motion

ITEM 2 (IRC) Committee Action: Disapproved

Committee Reason: The justification for the proposal lacks technical substantiation and is therefore insufficient to warrant this change.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association/Virginia Building Code Officials Association, requests Approved as Modified by this comment.

Modify proposal as follows:

IPC 405.3.1 Water closets, lavatories and bidets. A water closet, urinal or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction, or closer than 30 inches (762 mm) center–to–center between water closets and adjacent fixtures. A lavatory shall not be set closer than 12 inches (305 mm) from its center to any side wall, partition or other obstruction, for a corner type lavatory this clearance shall be measured from the center of the lavatory along the front edge of the lavatory to either side wall. There shall be at least 21 inches (533 mm) clearance in front of the water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall not be less than 30 inches (762 mm) wide or 60 inches (1524 mm) deep. (see Figure 405.3.1).

IRC P2705.1 (Supp) General. The installation of fixtures shall conform to the following:

(No change to items 1 - 4)

5. The center line of water closets or bidets shall not be less than 15 inches (381 mm) from adjacent walls or partitions or not less than 15 inches (381 mm) from center line of a bidet to the outermost rim of an adjacent water closet. A lavatory shall not
be set closer than 12 inches (305 mm) from its center to any side wall, partition or other obstruction, for a corner type lavatory, this clearance shall be measured from the center of the lavatory along the front edge of the lavatory to either side wall. There shall be at least 21 inches (533 mm) clearance in front of the water closet, bidet or lavatory to any wall, fixture or door. 

(No change to Items 6 and 7)

Commenter's Reason: The intention of this change is to reduce the lavatory clear space requirement to 24" across versus the 30" in the current code. This change will only effect the non-accessible residential type bathroom. The installation of 24" vanities should be permitted to provide additional flexibility in the code. The proposed modification is clarifying the clear space requirements for a corner type lavatory.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
Item 1 AS Item 2 AS
or
Item 1 D Item 2 D
or
Item 1 AMPC Item 2 AMPC

P33-02
405.8 (IRC P2705.1)

Proposed Change as Submitted:

Proponent: Sally Remedios, representing Delta Faucet Company

This proposal is on the agenda of the IPC and the IRC Plumbing Code Development Committees. See the tentative hearing orders for these committees.

Add new text as follows:

1. IPC 405.8 Design and installation of plumbing fixtures. Plumbing fixtures designed, or constructed on site, with fixture fitting mounting surfaces, shall be installed such that the fixture fitting mounting surface is not lower than .5 inch (13 mm) below the flood level rim of the fixture.

Revise as follows:

2. IRC P2705.1(Supp) General. The installation of fixtures shall conform to the following:
   (No change to items 1 - 7)

   8. Plumbing fixtures designed, or constructed on site, with fixture fitting mounting surfaces, shall be installed such that the fixture fitting mounting surface is no lower than .5 inch (13 mm) below the flood level rim of the fixture.

   Proponent’s Reason: This change will add new language in the code to cover the design and/or on-site construction of plumbing fixtures to ensure that fixture fittings, designed to meet the air gap requirements of fixture fitting standards, still provide back flow protection when mounted on a plumbing fixture.

ITEM 1 (IPC) Committee Action: Approved as Modified

Modify proposal as follows:

405.8 Design and installation of plumbing fixtures. Integral fixture fitting mounting surfaces on manufactured plumbing fixtures or plumbing fixtures constructed on site, shall meet the design requirements of ASME A112.19.2 or ASME A112.19.3. Plumbing fixtures designed or constructed on site, with fixture fitting mounting surfaces shall be installed such that the fixture fitting mounting surface is not lower than .5 inch (13 mm) below the flood level rim.

Committee Reason: The modification provides additional text for the design and installation of plumbing fixtures on mounting surfaces constructed on site. The reference to ASME standards provides the air gap requirements for the faucet.

Assembly Action: No Motion

ITEM 2 (IRC) Committee Action: Disapproved

Committee Reason: The proposed text included confusing and unclear language and the suggested modification was too extensive.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

Public Comment:

Sally Remedios, representing Delta Faucet Company, requests Approved as Modified by this comment.

Modify proposal as follows:

(No change to Item 1)

2. IRC P2705.1 (Supp) General.

   8. Integral fixture fitting mounting surfaces on manufactured plumbing fixtures or plumbing fixtures constructed on site, shall meet the design requirements of ASME A112.19.2 or ASME A112.19.3.

   8. Plumbing fixtures designed, or constructed on site, with fixture mounting surfaces, shall be installed such that the fixture fitting mounting surface is not lower than .5 inch (13 mm) below the flood level rim of the fixture.

Commenter's Reason: Technical consistency with P33-02 Item 1 (IPC) Approved as Modified for 405.8. IPC and IRC to read the same.

Not all plumbing fixture standards limit the allowable depression for fixture fitting mounting surfaces. In addition, on-site constructed fixtures,
such as Roman bathtubs with tiled surrounds, have no limitation on how the plumbing fixture fitting mounting surface is designed in relation to the flood level rim of the fixture.

When insufficient air gaps are measured in the field, a fixture fitting is deemed to be the culprit due to its ease of removal and replacement. In fact, the fixture itself could be the cause of the non-compliance, due to it being designed with a fitting mounting surface that decreases the allowable air gap significantly. Presently there is no avenue for the inspector to deem a plumbing fixture to be non-compliant for such an occurrence.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
- Item 1 AS Item 2 AS
- Item 1 AM Item 2 AMPC
- Item 1 D Item 2 D

P37-02
412.2 (IRC P2719.1)

Proposed Change as Submitted:

Proponent: John E. Matthews, PE, representing the Code Study and Development Committee of SE Michigan

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IPC 412.2 Floor drain trap and strainer. Floor drain traps shall have waste outlets of not less than 2 inches (51 mm) in diameter and removable strainers. The strainer shall have a waterway area of not less than the area of the tailpiece. The floor drain shall be constructed so that the drain is capable of being cleaned. Access shall be provided to the drain inlet.

Add new text as follows:

412.5 Floor drain connections. Floor drains shall connect to the sanitary drainage system.

Delete without substitution:

1104.3 Floor drains. Floor drains shall not be connected to a storm drain.

Revise as follows:

2. IRC P2719.1. Minimum size Floor drain trap and strainer. Floor drain traps shall have waste outlets not less than 2 inches (51 mm) in diameter and shall have removable strainers. The floor drain shall be constructed so that the drain is capable of being cleaned. Access shall be provided to the drain inlet.

Add new text as follows:

P2719.2 Floor drain connections. Floor drains shall connect to the sanitary drainage system.

Proponent’s Reason: The waterproofing area of the strainer shall be in accordance with referenced standards. Floor drains are considered as drainage fixtures and are to be connected to the drainage system. With the added text, Section 1104.3 of the IPC is no longer needed.

ITEM 1 (IPC) Committee Action: Disapproved

Committee Reason: Current text already addresses the size for floor drains and by deleting connection requirements creates confusion as where a floor drain connection is made.

Assembly Action: No Motion

ITEM 2 (IRC) Committee Action: Approved as Modified

Modify proposal as follows:

P2719.1 Floor drains. Floor drain traps shall have waste outlets not less than 2 inches (51 mm) in diameter and shall have removable strainers. The floor drain shall be constructed so that the drain is capable of being cleaned. Access shall be provided to the drain inlet.

P2719.2 Floor drain connections. Floor drains shall connect to the sanitary drainage system.

Committee Reason: The modification clarifies the intent of this section that the floor drain waste outlet must be 2 inches not the trap. In addition, the referenced text to floor drain connections is redundant and unnecessary.

Assembly Action: No Motion

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Suggested Scoping Modification for Item 1 for coordination with committee modification of Item 2.

IPC 412.2 Floor drain trap and strainer. Floor drain traps shall have waste outlets not less than 2 inches (51 mm) in diameter and shall have removable strainers. The floor drain shall be constructed so that the drain is capable of being cleaned. Access shall be provided to the drain inlet.

412.5 Floor drain connections. Floor drains shall connect to the sanitary drainage system.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
Item 1 AS  Item 2 AS
or
Item 1 AM  Item 2 AM
or
Item 1 D  Item 2 D

P39-02

419.1

Proposed Change as Submitted:


Revise as follows:

419.1 Approval. Urinals shall conform to ANSI Z124.9, ASME A112.19.2, CSA B45.1 or CSA B45.5. Urinals shall conform to the water consumption requirements of Section 605.4 Water supply fed urinals shall conform to the hydraulic performance requirements of ASME A122.19.6, CSA B45.1 or CSA B45.5.

Proponent’s Reason: The code should reflect all appropriate national consensus standards for these fixtures. Please note the copy of the Z124.9 standard. The standard addresses the performance requirements for urinals which are constructed of plastic.

Analysis: The proponent had not submitted the referenced standards for review prior to the printing of the monograph. If the standards are submitted within a reasonable time frame, staff will review them and provide the results to the committee members prior to the code hearings.

Committee Action: Disapproved

Committee Reason: The proposed text does not reference a standard for waterless urinals. The standard referenced in the proposed text ANSI Z124.9 is material requirements for plastic urinals. In addition, this type of urinal would conflict with the definition of a plumbing fixture, the hydraulic performance requirements of Section 419.2 and flushing devices required in Section 425.1.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Robert Friedlander, Construction Code Consultants, representing Falcon Waterfree Technologies, requests Approved as Modified by this comment.

Modify proposal as follows:

419.1 Approvals. Urinals shall conform to ANSI Z124.9, ASME A112.19.2, CSA B45.1 or CSA B45.5. Urinals shall conform to the water consumption requirements of Section 605.4 Water supply fed Urinals shall conform to the hydraulic performance requirements of ASME A122.19.6, CSA B45.1 or CSA B45.5. Water supply fed Urinals shall conform to the hydraulic performance requirements of ASME A122.19.6, CSA B45.1 or CSA B45.5.

Exception: The hydraulic performance requirements for listed urinals that do not depend on trap siphonage to discharge the fixture contents to the drainage system shall not apply.

Commenter’s Reason: The code should reflect all appropriate national consensus standards for these fixtures. ANSI Z124.9 addresses the performance requirements for urinals that are constructed of plastic. Section 425.1 of the code states “Flushing devices required. Each water closet, urinal, clinical sink and any plumbing fixture that depends on trap siphonage to discharge the fixture contents to the drainage system shall be provided with a flushometer valve or a flush tank designed and installed so as to supply water in quantity and rate of flow to flush the contents of the fixture, cleanse the fixture and refill the fixture trap.”

Public Comment 2:

Robert Friedlander, Construction Code Consultants, representing Falcon Waterfree Technologies, requests Approved as Modified by this comment.

Modify proposal as follows:

419.1 Approvals. Urinals shall conform to ANSI Z124.9, ASME A112.19.2, CSA B45.1 or CSA B45.5. Urinals shall conform to the water consumption requirements of Section 605.4 Water supply fed Urinals shall conform to the hydraulic performance requirements of ASME A122.19.6, CSA B45.1 or CSA B45.5.

Committee Reason: The code should reflect all appropriate national consensus standards for these fixtures. ANSI Z124.9 addresses the performance requirements for urinals which are constructed of plastic.

P48-02

424.4 (IRC P2708.3)

Proposed Change as Submitted:


THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IPC 424.4 (Supp)Shower valves. Shower and tub-shower combination valves shall be balanced pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016 Type P, T or PT or CSA CAN/CSA-B125. Bathtub-shower Type PT combination valves shall be thermostatic valves that conform to ASSE
Type T or PT or CSA CAN/CSA-B125 thermostatic type. Multiple (gang) showers supplied with a single tempered water supply pipe shall have the water supply for such showers controlled by a master thermostatic mixing valve complying with ASSE 1017. Shower and tub-shower combination valves and master thermostatic mixing valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer’s instructions.

2. IRC P2708.3 (Supp) Shower control valves.
Showers and tub-shower combinations shall be equipped with control valves of the pressure balance, the thermostatic mixing or the combination pressure balance/thermostatic mixing valve types with high limit stops in accordance with ASSE/ANSI 1016. Bathtub-shower Type PT combination valves shall be thermostatic valves that conform to ASSE 1016 Type T or PT or CSA CAN/CSA-B125 thermostatic type. The high limit stops shall be set to limit water temperature to a maximum 120°F (49°C).

Proponent’s Reason: This amendment to the text attempts to clarify the applications of specific valves for specific uses. Type P are pressure type valves; Type T are thermostatic valves and Type PT are combination valves.

ITEM 1 (IPC)
Committee Action: Disapproved
Committee Reason: The justification for the proposal lacks technical substantiation and is therefore insufficient to warrant this change and is overly restrictive.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved
Committee Reason: The justification for the proposal lacks technical substantiation and is therefore insufficient to warrant this change and is overly restrictive.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rand Ackroyd, Rand Engineering, requests Approved as Submitted for Items 1 and 2.

Commenter’s Reason: Shower and bath applications must be separated. They require different minimum protection to prevent injury. In showers, the primary danger is thermal shock and this danger can be addressed by using ASSE 1016 type P, T or PT devices. In the bathtub, the danger is immersion scalding. This danger can be addressed by using ASSE 1016 type T or PT devices. ASSE 1016 type P devices with simply a mechanical limit stop for high temperature limiting does not offer protection when the hot or cold water temperature to the fixture increases.

Thousands of children receive serious tap water scalds annually. See www.safekids.org and search on scalding.

P49-02
424.4.1(IRC P2713.2)

Proposed Change as Submitted:


THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Add new text as follows:

1. IPC 424.4.1 Bathtub Valves. Bathtub valves, when not integral to a combination tub-shower valve, shall conform to ASSE 1016 Type T or PT or CSA CAN/CSA B125 thermostatic type. Valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C).

2. IRC P2713.2 Bathtub Valves. Bathtub valves, when not integral to a combination tub-shower valve, shall conform to ASSE 1016 Type T or PT or CSA CAN/CSA B125 thermostatic type. Valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C).

Proponent’s Reason: There are many incidents of hot water submersion of children and the elderly in which scalding occurs. A one second exposure to 150°F will result in a third degree burn. Millions of dollars are spent attempting to treat damaged skin in very painful surgical processes. Such incidents are preventable with available technology.

ITEM 1 (IPC)
Committee Action: Disapproved
Committee Reason: The proposed text is overly restrictive and there are other devices that address temperature control other than the ASSE 1016 and CSA B125 valves. In addition, the proposed text is premature and standards are currently being developed to reference temperature control.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved
Committee Reason: The proposed text is overly restrictive and there are other devices that address temperature control other than the ASSE 1016 and CSA B125 valves.

Assembly Action: No Motion
Staff note: The IPC Committee voted to request the formation of an Ad Hoc Committee to study and develop code language to address all aspects of scald protection.

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:
Rand Ackroyd, Rand Engineering, requests Approved as Submitted for Items 1 and 2.

Commenter's Reason: Shower and bath applications must be separated. They require different minimum protection to prevent injury. In showers, the primary danger is thermal shock and this danger can be addressed by using ASSE 1016 type P, T or PT devices. In the bathtub, the danger is immersion scalding. This danger can be addressed by using ASSE 1016 type T or PT devices. ASSE 1016 type P devices with simply a mechanical limit stop for high temperature limiting does not offer protection when the hot or cold water temperature to the fixture increases.

Thousands of children receive serious tap water scalds annually. See www.safekids.org and search on scalding.

P55-02 502.2 Proposed Change as Submitted:
Proponent: Robert Friedlander, Construction Code Consultants, representing RectorSeal Corporation
Add new text as follows:
502.2 Water heaters installed in garages. Water heaters having an ignition source shall be elevated such that the ignition source is not less than 18 inches (457 mm) above the garage floor. Listed elevation devices shall comply with ANSI/CSA LC 3.

Exception: Elevation of the ignition source is not required for water heaters that are listed for installation on the floor.

( Renumber remaining section)

CHAPTER 13 REFERENCED STANDARDS
ANSI/CSA LC 3-2000 Appliance Stands and Drain Pans 502.2

Proponent's Reason: This language should be included in the Plumbing Code. It is the plumber who installs water heaters. When a manufactured stand is used, it should be listed to this ANSI Standard.

Analysis: Section 502.2 was deleted by code change P47-01 because Section 502.1 requires water heaters to meet the requirements of the IECC, the IFGC or the IMC. The committee's reason indicated that it is not necessary to repeat a code requirement that mandates those requirements.

Committee Action: Disapproved
Committee Reason: The proposed language creates confusion and can be misinterpreted to require listed elevation devices for all water heaters.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:
Robert Friedlander, Construction Code Consultants, representing RectorSeal Corporation, requests Approved as Submitted.

Commenter's Reason: It is difficult to understand how this new sentence "Listed elevation devices shall comply with ANSI/CSA LC 3." could be "misinterpreted to require listed elevation devices for all water heaters". This language should be included in the Plumbing Code. It is the plumber who installs water heaters. When a manufactured stand is used, it should be listed to this ANSI Standard.

P56-02 504.6.1 (IRC P2803.6.1) Proposed Change as Submitted:
Proponent: Ronald L. George, CIPE, CPD, Smith Group, Inc., Architects/Engineers, representing Code Study and Development Committee of SE Michigan

Revise as follows:
1. IPC 504.6.1 Discharge. The relief valve shall discharge full size to a safe place of disposal such as the floor, outside the building, or an indirect waste receptor. The discharge pipe shall not have any trapped sections and shall have a visible air gap or air gap fitting located in the same room as the water heater. The outlet end of the discharge pipe shall not be threaded and such discharge pipe shall not have a valve or tee installed. Relief valve piping shall be piped independent of other equipment drains or relief valve discharge piping to the disposal point. Such pipe shall be installed in a manner
that does not cause personal injury to occupants in the immediate area or structural damage to the building.

2. IRC P2803.6.1 Requirements of discharge pipe. The outlet of a pressure relief valve shall not be directly connected to the drainage system. The discharge from a relief valve shall be piped full size separately to the floor, to the outside of the building or to an indirect waste receptor located inside the building. In areas subject to freezing, the relief valve shall discharge through an air gap into an indirect waste receptor located within a heated space, or by other approved means. The discharge shall be installed in a manner that does not cause personal injury or property damage and that is readily observable by the building occupants. The discharge from a relief valve shall not be trapped. The diameter of the discharge piping shall not be less than the diameter of the relief valve outlet. The discharge pipe shall be installed as to drain by gravity flow and shall terminate atmospherically not more than 6 inches (152 mm) above the floor. The outlet end of the discharge pipe shall not be threaded and such discharge pipe shall not have a valve or tee installed. Relief valve piping shall be piped independent of other equipment drains or relief valve discharge piping to the disposal point.

Proponent’s Reason: 1. The code does not allow valves between the relief valve and the water heater, but the code is silent concerning valves and other connections on the discharge piping from the relief valve.

2. If the discharge from relief valves are combined together, the occupant cannot be sure which valve is discharging. Relief valves discharging into a combined piping system can cause backpressure on other relief valves causing their relief pressure to be higher. The code should address this situation.

ITEM 1 (IPC)
Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason. The requirement for independent piping of the drains will help identify which relief valve is leaking.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved

Committee Reason: The committee prefers the existing language and the proposed text is overly restrictive.

Assembly Action: No Motion

Proposed Change as Submitted:

Proponent: Robert Friedlander, Construction Code Consultants, representing RectorSeal Corporation

Revise as follows:

IPC 504.7 Required pan. Where water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tank or water heater shall be installed in a galvanized steel pan having a minimum thickness of 24 gage, or other pans approved for such use. Listed pans shall comply with ANSI/CSA LC 3.

Proponent’s Reason: This language and standard was approved last year for the IRC. This proposal addresses the concerns that the IPC Committee had last year with respect to “site built pans and other pans which have previously been accepted”.

Committee Action: Disapproved

Committee Reason: Overly restrictive by requiring all pans to comply with ANSI/CSA LC 3.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:

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<tr>
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<td>Item 2</td>
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P58-02

504.7

Proposed Change as Submitted:

Proponent: Robert Friedlander, Construction Code Consultants, representing RectorSeal Corporation

Revise as follows:

IRC P2801.5 Required pan. Where water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tank or water heater shall be installed in a galvanized steel pan having a minimum thickness of 24 gage (0.016 inch) (0.4 mm) or other pans approved for such use. Listed pans shall comply with CSA LC 3.

Proponent’s Reason: This language and standard was approved last year for the IRC. This proposal addresses the concerns that the IPC Committee had last year with respect to “site built pans and other pans which have previously been accepted”.

Committee Action: Disapproved

Committee Reason: Overly restrictive by requiring all pans to comply with ANSI/CSA LC 3.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.
Robert Friedlander, Construction Code Consultants, representing RectorSeal Corporation, requests Approved as Submitted.

Commenter’s Reason: This proposal achieves technical consistency between the IPC and IRC. The proposal only requires that when a pan is “listed” it shall comply with ANSI/CSA LC 3. When the Administrative Authority allows a pan that is not listed to be installed, it would not require compliance with the standard.

P61-02
603.2 (IRC P2904.4.1)

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Fairfax County, VA, representing Virginia Plumbing and Mechanical Inspectors Association & Virginia Building Code Official Association

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IPC 603.2 Separation of water service and building sewer. Water service pipe and the building sewer shall be separated by 5 feet (1524 mm) of undisturbed or compacted earth.

   Exceptions:
   1. The required separation distance shall not apply where the bottom of the water service pipe within 5 feet (1524 mm) of the building sewer is a minimum of 12 inches (305 mm) above the top of the highest point of the building sewer and the pipe materials conform to Section 703.1.
   2. The required separation distance shall not apply where a water service pipe crosses a sewer pipe, provided the water service pipe is sleeved to at least 5 feet (1524 mm), horizontally from the sewer pipe centerline, on both sides of such crossing with pipe materials listed in Tables 605.4, 702.2 or 702.3.

2. IRC P2904.4.1 Water service installation. Trenching, pipe installation and backfilling shall be in accordance with P2604. Water-service pipe is permitted to be located in the same trench with a building sewer provided such sewer is constructed of materials listed for underground use within a building in P3002.1. If the building sewer is not constructed of materials listed in P3002.1, the water-service pipe shall be separated from the building sewer by a minimum of 5 feet (1524 mm), measured horizontally, of undisturbed or compacted earth or placed on a solid ledge at least 12 inches (305 mm) above and to one side of the highest point in the sewer line.

   Exception: The required separation distance shall not apply where a water service pipe crosses a sewer pipe, provided the water service pipe is sleeved to at least 5 feet (1524 mm), horizontally from the sewer pipe centerline, on both sides of such crossing with pipe materials listed in Tables P2904.4.1, P3002.1 and P3002.2.

   Proponent’s Reason: Often times due to uncontrollable circumstances a water service must cross a sewer. This proposal offers some relief by recognizing an already common method of protecting the water line with a sleeve.

ITEM 1 (IPC)
Committee Action: Approved as Submitted

Committee Reason: The proposed text provides an additional installation method where the separation of the water service and building sewer crosses.

Assembly Action: No motion

ITEM 2 (IRC)
Committee Action: Approved as Submitted

Committee Reason: The proposed text provides an additional installation method where the separation of the water service and building sewer crosses.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Judson W. Collins, Oklahoma State Health Department, Health Facilities Plan Review, requests Approved as Modified by this comment.

Modify proposal as follows:

IPC 603.2 Separation of water service and building sewer. Water service pipe and the building sewer shall be separated by 5 feet (1524 mm) of undisturbed or compacted earth.

   Exceptions:
   1. The required separation distance shall not apply where the bottom of the water service pipe within 5 feet (1524 mm) of the building sewer is a minimum of 12 inches (305 mm) above the top of the highest point of the building sewer and the pipe materials conform to Section 703.1.
   2. The required separation distance shall not apply where a water service pipe crosses a sewer pipe, provided the water service pipe is sleeved to at least 5 feet (1524 mm), horizontally from the sewer pipe centerline, on both sides of such crossing with pipe materials listed in Tables 605.4, 702.2 or 702.3.
The required separation distance shall not apply where a water service pipe crosses over or under a sewer pipe, provided that the water service pipe is installed in a pipe sleeve constructed of pipe materials listed in Tables 605.4, 702.2 or 702.3. The sleeve shall extend from the centerline of the building sewer on both sides of the crossing to points not less than 5 feet (1524 mm) plus the radius of the sewer pipe, measured horizontally and perpendicular to the sewer pipe.

**IRC P2904.4.1 Water service installation.** Trenching, pipe installation and backfilling shall be in accordance with 92604. Water-service pipe is permitted to be located in the same trench with a building sewer provided such sewer is constructed of materials listed for underground use within a building in P3002.1. If the building sewer is not constructed of materials listed in P3002.1, the water-service pipe shall be separated from the building sewer by a minimum of 5 feet (1524 mm), measured horizontally, of undisturbed or compacted earth or placed on a solid ledge at least 12 inches (305 mm) above and to one side of the highest point in the sewer line.

**Exception:** The required separation distance shall not apply where a water service pipe crosses a sewer pipe, provided the water service pipe is sleeved to at least 5 feet (1524 mm), horizontally from the sewer pipe centerline, on both sides of such crossing with pipe materials listed in Tables P2904.4.1, P3002.1 and P3002.2.

**Exception:** The required separation distance shall not apply where a water service pipe crosses over or under a sewer pipe, provided that the water service pipe is installed in a pipe sleeve constructed of pipe materials listed in Tables P2904.4.1, P3002.1 or P3002.2. The sleeve shall extend from the centerline of the building sewer on both sides of the crossing to points not less than 5 feet (1524 mm) plus the radius of the sewer pipe, measured horizontally and perpendicular to the sewer pipe.

**Commenter’s Reason:** P61-02 is a needed addition to the code, however, the wording can be improved to better express the proponent’s intent. The current wording:

1. does not address whether the crossing is over or under the sewer;
2. does not account for the fact that the sewer could be large in diameter and a centerline measurement would affect the actual separation distance based on the diameter of the sewer pipe; and
3. does not address the fact that the crossing could be at any angle with the sewer and the intent is to maintain a 5 foot lateral separation measured 90 degrees (perpendicular) to the sewer pipe.

**Analysis:** The following combinations of actions would achieve technical consistency between the IPC and the IRC:

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<tr>
<th>Item 1</th>
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**P64-02**

**T. 605.4 (IRC T. P2904.4.1)**

**Proposed Change as Submitted:**

**Proponent:** Stephen Lamb, Nickel Development Institute

**THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**
1. IPC

TABLE 605.4
WATER SERVICE PIPE

<table>
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<tr>
<th>MATERIAL</th>
<th>STANDARD</th>
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</thead>
<tbody>
<tr>
<td>Type 304/304L, stainless steel</td>
<td>ASTM A312; ASTM A778</td>
</tr>
<tr>
<td>Type 316/316L, stainless steel</td>
<td>ASTM A312; ASTM A778</td>
</tr>
</tbody>
</table>

TABLE 605.5
WATER DISTRIBUTION PIPE

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 304/304L, stainless steel</td>
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<td>Type 316/316L, stainless steel</td>
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</tr>
</tbody>
</table>

TABLE 605.6
PIPE FITTINGS

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 304/304L, stainless steel</td>
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</tr>
<tr>
<td>Type 316/316L, stainless steel</td>
<td>ASTM A312; ASTM A778</td>
</tr>
</tbody>
</table>

Revise as follows:

605.22 Joints between different materials. Joints between different piping materials shall be made with a mechanical joint of the compression or mechanical-sealing type, or as permitted in Sections 606.22.1 and 606.22.2 and 606.22.3. Connectors or adapters shall have an elastomeric seal conforming to ASTM D 1869 or ASTM F 477. Joints shall be installed in accordance with the manufacturer’s instructions.

605.22.3 Stainless steel. Joints between stainless steel and different piping materials shall be made with a mechanical joint of the compression or mechanical sealing type or a dielectric fitting.

605.23 Stainless steel. Joints between stainless steel pipe and fittings shall comply with Sections 605.23.1 and 605.23.2.

605.23.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer’s instructions.

605.23.2 Welded joints. All joint surfaces shall be cleaned. The joint shall be welded autogenously or with an approved filler metal, as referenced in ASTM A312.

2. IRC

TABLE P2904.4.1
WATER SERVICE PIPE

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 304/304L, stainless steel</td>
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TABLE P2904.5
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TABLE P2904.6
PIPE FITTINGS

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<tr>
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</tr>
<tr>
<td>Type 316/316L, stainless steel</td>
<td>ASTM A312; ASTM A778</td>
</tr>
</tbody>
</table>

Add new text as follows:

P2904.9 Stainless steel. Joints between stainless steel pipe and fittings shall comply with Sections P2904.15.1 and P2904.15.2.

P2904.9.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer’s instructions.

P2904.9.2 Welded joints. All joint surfaces shall be cleaned. The joint shall be welded autogenously or with an approved filler metal, as referenced in ASTM A312.

( Renumber remaining section)

Revise as follows:

P2904.14 Joints between different materials. Joints between different piping materials shall be made in accordance with Sections P2904.14.1 and P2904.14.2 and P2904.14.3 or with a mechanical joint of the compression or mechanical sealing type having an elastomeric seal conforming to ASTM D 1869 or ASTM
Add new text as follows:

**P2904.14.3 Stainless steel.** Joints between stainless steel and different piping materials shall be made with a mechanical joint of the compression or mechanical sealing type or a dielectric fitting.

**Proponent’s Reason:** The proposed change adds new requirements to the code to allow additional choices for the design engineer. These materials conform to, and meet, the requirements of NSF Standard 61 (refer to Appendix C). No increased costs are anticipated based on life cycle costs.

**ITEM 1 (IPC)**
- **Committee Action:** Approved as Submitted
- **Committee Reason:** Based on proponent’s published reason.
- **Assembly Action:** No Motion

**ITEM 2 (IRC)**
- **Committee Action:** Disapproved
- **Committee Reason:** The proposed text would significantly increase construction costs and is not applicable to residential installations.
- **Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted.

**Public Comment:**

Stephen Lamb, Nickel Development Institute, requests Approved as Submitted for Items 1 and 2.

**Commenter’s Reason:** The reason for denial is stated as “...the text would significantly increase construction costs and is not applicable to residential applications”. The original proposal refuted the increase of construction costs, based on life cycle cost, while providing additional choices to the design engineer. Also, these materials are being used extensively in Europe and Japan, today, for internal water service applications.

It is the proponent's position and understanding that this rejection (split decision) was based on the use of permissive language referenced in the ASTM specifications. However, the permissive language is not enforceable in these specifications, and in fact, these ASTM specifications meet the intent of the ICC Standard contents, as spelled out in ICC Section 3.6.2.

**Analysis:** The following combinations of actions would achieve technical consistency between the IPC and the IRC:
- Item 1 AS Item 2 AS
- or

**P65-02**

**605.4 Proposed Change as Submitted:**

**Proponents:** Judson W. Collins, Oklahoma State Health Department

Robert G. Konyndyk, Bureau of Construction Codes, representing the State of Michigan

**Revise as follows:**

**605.4 Water service pipe.** Water service pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table P605.4. All water service pipe or tubing, installed underground and outside of the structure, shall have a minimum working pressure rating of 160 psi (1100 kPa) at 73.4°F (23°C). Where the water pressure exceeds 160 psi (1100 kPa), piping material shall have a minimum rated working pressure equal to the highest available pressure. Plastic water service piping shall terminate within 5 feet (1524 mm) inside the point of entry into a building of the exterior walls of a building. All ductile iron water pipe shall be cement mortar lined in accordance with AWWA C104.

**Proponent's Reason:** (Collins) The proposed text will clarify the intent of the code. The current text would allow water service piping to run under a slab until the piping penetrated the slab, which becomes the “point of entry”. Water service piping standards are less stringent than water distribution piping standards. Water distribution piping is not as accessible as water service piping, therefore it must meet more stringent requirements. Allowing water service piping in inaccessible locations is not what the code intends.

(Konyndyk) The purpose of this code change is to insure that water service piping which was acceptable on the exterior of a building and which might not meet the acceptable standards for water distribution pipe will not be located within the building. It is important to consider that piping materials underneath a building are not as accessible for service or repair as on the exterior of a structure.

**Committee Action:** Disapproved

**Committee Reason:** The proposed text would single out plastic water service and the intent of this section should apply to all water service piping. It could also force a change in materials under the slab which would create a joint with an increased potential for leakage.

**Assembly Action:** Approved as Submitted - Motion Failed

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.
James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association/Virginia Building Code Officials Association, requests Approved as Modified by this comment.

Modify proposal as follows:

605.4 Water service pipe. Water service pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table P605.4. All water service pipe or tubing, installed underground and outside of the structure, shall have a minimum working pressure rating of 160 psi (1100 kPa) at 73.4°F (23°C). Where the water pressure exceeds 160 psi (1100 kPa), piping material shall have a minimum rated working pressure equal to the highest available pressure. Plastic water service piping shall terminate within 5 feet (1524 mm) inside of the point where the pipe penetrates an exterior wall or slab on grade of a building. All ductile iron water pipe shall be cement mortar lined in accordance with AWWA C104.

Commenter's Reason: The proponent's intention of this change was to clarify the code. However, his language did not allow water service pipe to be installed under a slab. This modification will fix that problem as well as clarify the code.

P68-02

605.6 (IRC P2904.6)

Proposed Change as Submitted:

Proponent: Steve Yunker, representing SBCCI Plumbing Code Action Committee

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IPC 605.6 Fittings and valves. Pipe fittings and valves shall be approved for installation with the piping material installed and shall conform to the respective pipe standards or one of the standards listed in Table P605.6. All pipe fittings and valves utilized in water supply systems shall also conform to NSF 61. The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping. Ductile and gray iron pipe fittings shall be cement mortar lined in accordance with AWWA C104.

Delete without substitution:

605.8 Valves. All valves shall be of the approved type and compatible with the type of piping material installed in the system.

2. IRC P2904.6 (Supp) Fittings and valves. Pipe fittings and valves shall be approved for installation with the piping material installed, and shall conform to the respective pipe standards listed in Table P2904.6. Pipe fittings and valves utilized in the water supply system shall also conform to NSF 61.

Proponent's Reason: This standard is intended to cover specific materials or products that come into contact with drinking water, drinking water treatment chemicals, or both. The products and materials covered include but are not limited to, process media, protective materials, joining and sealing materials, pipes and related products (pipes, tanks and fittings), mechanical devices used in treatment of distribution systems (valves, chlorinators, separation membranes) and mechanical plumbing devices (faucets, endpoint control valves, etc.). Valves in the water distribution system should also be required to conform to NSF 61. Combining 605.8 with 605.6 simplifies the code and achieves the application of NSF 61 to the valves and the fittings.

ITEM 1 (IPC)

Committee Action: Disapproved

Committee Reason: The proposed text implies that all valves installed on the water supply system must comply with the standard NSF 61 and this would be a misapplication of such standard. Current text already addresses pipe, fittings and faucets that come in contact with drinking water and the requirements to meet NSF 61. In addition, the proposed text did not address a definition or standard for valves.

Assembly Action: No Motion

ITEM 2 (IRC)

Committee Action: Approved as Submitted

Committee Reason: Proposed text adds the requirement that valves utilized in the water supply system must comply with the health effects standard NSF 61.

Assembly Action: Disapproved

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code, an assembly action was successful and a public comment was submitted.

Public Comment 1:

Ron Coiner, representing NSF International, requests Approved as Modified for Item 1 by this comment.

Modify proposal as follows:

605.6 Fittings and valves. Pipe fittings and valves shall be approved for installation with the piping material installed and shall conform to the respective pipe standards or one of the standards listed in Table P605.6. All pipe fittings and valves utilized in water supply systems shall also conform to NSF 61. The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping. Ductile and gray iron pipe fittings shall be cement mortar lined in accordance with AWWA C104.

605.8 Valves. All valves shall be of the approved type and compatible with the type of piping material installed in the system. All valves
utilized in the water system for drinking or culinary purposes shall conform to the requirements of NSF/ANSI Standard 61:

(No change to Item 2)

Commenter’s Reason: The proposed wording addresses the objections concerning a misapplication of NSF/ANSI Standard 61 by excluding items that are not drinking water endpoints (toilets, showers, and boiler valves), and only requiring compliance with Standard 61 for valves used in drinking water or culinary applications.

NSF/ANSI Standard 61 was developed to assure protection of public health as it relates to materials and products that come into contact with drinking water. The products and materials covered include, but are not limited to process media, protective barrier materials, joining and sealing materials, pipes and related components (pipes, tanks, and fittings), mechanical devices used in the treatment of distribution systems (valves, chlorinators, and separation membranes), and mechanical plumbing devices (faucets, and endpoint control valves).

Current language in the IPC requiring that pipe, fittings, and faucets comply with NSF/ANSI Standard 61 supports the position that the valves should meet the same requirement when used in systems with a drinking water or culinary end-point.

Given that requirements for valves in drinking water applications already exist in NSF/ANSI Standard 61 and the existing text in the IPC requiring compliance with the Standard for other system components, the extension of the code requirement to valves is consistent with the established intent of both documents and is protective of public health.

The objection that valves are not defined is not persuasive since valves are referenced throughout the code and users generally understand the term.

Public Comment 2:

David Viola, Plumbing Manufacturers Institute, requests Disapproved for Items 1 and 2.

Commenter’s Reason: NSF 61 provides minimum health effects requirements for products in contact with water intended for human consumption. Without a definition for valve, this proposal would require all shutoff, backflow preventer, pressure reducing, in-line thermostatic, flushometer, ballcock, check and shower valves to be in compliance with NSF 61. This conflicts with 424.4, which only intends for products that supply drinking water intended for human ingestion to comply with NSF 61. Section 9, NSF 61, Section 9 exempts devices, such as shower valves, public lavatory faucets, roman tub valves, and other endpoint valves that are not specifically intended to dispense water for human ingestion.

Besides being a misapplication of NSF 61, there was no justification provided to arbitrarily focus on valves.

It should be noted that Part 1 of P68-02 was disapproved by the IPC Committee, and the assembly action on Part 2 was disapproved for the same reasons stated above. We ask the membership to disapprove this proposal as well.

Public Comment 3:

Steve Yunker, City of Hendersonville, TN, requests Approved as Modified by this comment.

Modify current text as follows:

1. IPC 605.6 Fittings. Pipe fittings shall be approved for installation with the piping material installed and shall conform to the respective pipe standards or one of the standards listed in Table P605.6. All pipe fittings utilized in water supply systems shall also conform to NSF 61. The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping. Ductile and gray iron pipe fittings shall be cement mortar lined in accordance with AWWA C104.

2. IRC P2904.6 (Supp) Fittings and valves. Pipe fittings shall be approved for installation with the piping material installed, and shall conform to the respective pipe standards listed in Table P2904.6. Pipe fittings utilized in the water supply system shall also conform to NSF 61. All valves shall be of the approved type and compatible with the type of piping material installed in the system. Valves conveying potable water for drinking or culinary purposes shall conform to NSF 61.

Commenter’s Reason: The last sentence in this proposed Section 605.8 has clear meaning in the 2000 IPC. As potable water is supplied to all plumbing fixtures (including water closets), the distinction for valves conveying water for drinking or culinary purposes is required. This removes the objection that “all valves (including flush valves) installed in the water supply system must comply”. End point devices including supply shut off valves are already covered under the NSF 61 by Federal Safe Drinking Water acts. The modification to IRC P2904.6 will correlate the language with the IPC.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:

<table>
<thead>
<tr>
<th>Item 1</th>
<th>Item 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>AS</td>
<td>AS</td>
</tr>
<tr>
<td>AMPC</td>
<td>AMPC</td>
</tr>
</tbody>
</table>

P73-02

607.3.1 (IRC P2903.4)

Proposed Change as Submitted:

Proponent: Steve Yunker, representing the SBCCI Plumbing Code Action Committee

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IPC 607.3.1 Pressure-reducing valve. For water service system sizes up to and including 2 inches (51 mm), a device for controlling pressure shall be installed where, because of thermal expansion, the pressure on the downstream side of a pressure-reducing valve exceeds the main supply pressure. A pressure-reducing valve with an integral bypass check valve or other device shall be installed to satisfy this requirement.

2. IRC P2903.4 Thermal expansion. In addition to the required pressure relief valve, an approved device for thermal expansion control shall be installed on any water supply system utilizing storage water heating equipment.
whenever the building supply pressure is greater than the required relief exceeds the pressure reducing valve pressure setting or when any device, such as a pressure reducing valve, backflow preventer or check valve, is installed that prevents pressure relief through the building supply. The thermal expansion control device shall be sized in accordance with the manufacturer's installation instructions.

Proponent's Reason: It does not matter whether the pressure in the water service system exceeds the main supply pressure. The important pressure in this instance is the setting on the pressure reducing valve that reduces the main supply pressure. This is consistent with the IRC.

ITEM 1 (IPC)
Committee Action: Disapproved
Committee Reason: The committee disapproved in favor of P74-02.
Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved
Committee Reason: The committee preferred existing language as to the intent of this section.
Assembly Action: No Motion

Individual Consideration Agenda
This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:
Judson W. Collins, Oklahoma State Health Department, Health Facilities Plan Review, requests Approved as Submitted for Items 1 and 2.

Commenter's Reason: This is a necessary change. P74-02 was also a necessary change but it did not go far enough. The IRC committee chose P74-02 over P73-02 apparently thinking that the two changes did the same thing. However, that is not the case. P74-02 removes a pressure-reducing valve with an integral bypass as a means of addressing thermal expansion. P73-02 deals with the pressures exerted on the water distribution system. The only reason that a pressure-reducing valve is installed on a water service is the keep the pressure on the water distribution system to 80 psig or less, as required by Section 604.8. Thermal expansion control is designed to limit the pressures on the water distribution system. If such devices are designed to limit the pressure in the water distribution system to the pressure in the water service, as currently required by the code, the water distribution system can be subjected to pressures reaching 200 psig. For example, if the water service supplies water to a building at 120 psig, the current code text would not require thermal expansion control until the pressure in the water distribution system exceeds 120 psig, which is considerably higher than the 80 psig maximum requirement. That is not the intent of the code and this code change will satisfy the intent.

Public Comment 2:

Guy Tomberlin, Fairfax County, VA, representing Virginia Plumbing and Mechanical Inspectors Association, requests Approved as Submitted for Items 1 and 2.

Commenter's Reason: This item was disapproved due to the lack of a thorough explanation. This proposed wording is extremely important to the plumbing code because current text allows an undesirable situation. When the street pressure is higher than the pressure relief valve setting on the water heater, then limited means to relieve thermal expansion exist if the installation included the pressure reducing valve bypass as the means to provide thermal expansion. For example, if the water main pressure is 160 psi and the pressure reducing valve is installed because of the 80 psi maximum working pressure requirement, current language allows the system to take advantage of the pressure reducing valve to provide relief of thermal expansion if the valve has an integral bypass. Again, remember that the street pressure is 160 psi. When thermal expansion reaches about 150 psi within the system the pressure relief valve installed at the water heater is going to release before the water main supply is able to absorb the expansion at 160 psi. This proposed language corrects a serious flaw in design application of existing code text.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:

<table>
<thead>
<tr>
<th>IPC</th>
<th>IRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1 AS</td>
<td>Item 2 AS</td>
</tr>
<tr>
<td>Item 1 D</td>
<td>Item 2 D</td>
</tr>
</tbody>
</table>

P81-02
705.21 (IRC P3003.4.5)

Proposed Change as Submitted:


THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Add new text as follows:

1. IPC 705.21 Joints between drainage piping and water closets. Joints between drainage piping and water closets or similar fixtures shall be made by means of a closet flange compatible with the drainage system material, securely fastened to a structurally firm base. The inside diameter of the drainage pipe shall not be used as a socket fitting for a four by three closet flange. The joint shall be bolted, with an approved gasket, setting compound or sealing mechanism which conforms to ASME A112.4.3 between the fixture and the closet flange.

Revise as follows:

2. IRC P3003.4.5 Joints between drainage piping and water closets. Joints between drainage piping and water closets or similar fixtures shall be made by means of a closet flange compatible with the drainage system
material, securely fastened to a structurally firm base. The inside diameter of the drainage pipe shall not be used as a socket fitting for a four by three closet flange. The joint shall be bolted, with an approved gasket, flange-to-fixture connection complying with ASME A112.4.3, or setting compound or sealing mechanism which conforms to ASME A112.4.3 between the fixture and the closet flange.

Proponent's Reason: ASME A112.4.3, entitled Plastic Fittings for Connecting Water Closets to the Sanitary Drainage System, addresses performance and materials requirements for special connectors which are used in lieu of the wax ring to connect water closets to the drainage system. This change will make the IPC consistent with the IRC.

ITEM 1 (IPC)
Committee Action: Disapproved
Committee Reason: The proposed text is unnecessary as floor and drainage connections are already covered in Section 405.4.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Approved as Submitted
Committee Reason: The proposed text provides an additional standard for connections made between drainage piping and water closets.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
Item 1D Item 2 D
or
Item 1 AS Item 2 AS

1. IPC 708.7 Minimum size. Cleanouts shall be the same nominal size as the pipe they serve up to 4 inches (102 mm). For pipes larger than 4 inches (102 mm) nominal size, the minimum size of the cleanout shall be 4 inches (102 mm).

Exceptions:
1. "P" trap connections with slip joints or ground joint connections, or stack cleanouts that are not more than one pipe diameter smaller than the drain served, shall be permitted.
2. Cast iron cleanout sizing shall be in accordance with referenced standards in Table 702.4, ASTM A 74 for hub and spigot fittings or ASTM A 888 or CISPI 301 for hubless fittings.

2. IRC P3005.2.9. Cleanout size. Cleanouts shall be sized in accordance with Table P3005.2.9.

Exceptions:
1. "P" trap connections with slip joints or ground joint connections, or stack cleanouts that are not more than one pipe diameter smaller than the drain served, shall be permitted.
2. Cast iron cleanout sizing shall be in accordance with referenced standards in Table 3002.1, ASTM A 74 for hub and spigot fittings or ASTM A 888 or CISPI 301 for hubless fittings.

Proponent's Reason: The referenced standards for cast iron soil pipe and fittings under Table 702.4 require a different tap size than the requirements, under Section 708.7, thus creating a conflict in the code. This added text will clarify the section, and will also prove more cost effective as larger taps require larger and more expensive brass plugs.

ITEM 1 (IPC)
Committee Action: Approved as Submitted
Committee Reason: Based on proponent's published reason.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved
Committee Reason: The committee preferred existing language which already addresses the sizing of cleanouts.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
Item 1 AS Item 2 AS
or

P83-02
708.7 (IRC P3005.2.9)

Proposed Change as Submitted:

Proponent: Jonathan Sargeant, Cast Iron Soil Pipe Institute, representing Dewey Manus, Charlotte Pipe and Foundry

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:
P87-02  
708.7 (IRC P3005.2.9) 

Proposed Change as Submitted: 

Proponent: Jack Beuschel, representing Studor, Inc. 

Revise as follows: 

901.3 Chemical waste vent system. The vent system for a chemical waste system shall be independent of the sanitary vent system and shall terminate separately through the roof to the open air or to an air admittance valve in accordance with Section 917.8. 

Proponent’s Reason: The IPC approves the use of air admittance valves (AAVs) for single fixture and branch venting. Their use has been prohibited in supply or return air plenums since the materials commonly used to manufacture AAVs are ABS and PVC. These plastics are not chemical or acid resistant. For example, Teflon® is a material that is very resistant to chemicals and acids. It is comparable to borosilicate glass, which is permitted in special waste systems. This code change will permit the use of AAVs manufactured from Teflon® or other acid and chemical resistant material to be installed in nonneutralized special waste systems. These systems are very difficult to vent to the atmosphere since the fixtures are generally located in islands. 

Committee Action: Disapproved 

Committee Reason: Based on previous action taken on P96-02. 

Assembly Action: No Motion 

Individual Consideration Agenda 

This item is on the agenda for individual consideration because a public comment was submitted. 

Public Comment: 

Jack Beuschel, representing Studor Inc., requests Approved as Submitted. 

Commenter’s Reason: This change is a companion change to P96-02. P87-02 would allow the vent for a chemical waste system to terminate through the roof to the open air or to an air admittance valve in accordance with the exception to Section 917.8. 

P89-02  
903.3 (IRC P3102.3) 

Proposed Change as Submitted: 

Proponent: Jack Beuschel, representing Studor, Inc. 

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES. 

Revise as follows: 

1. IPC 903.3 Vent termination. Every vent stack or stack vent shall extend outdoors and terminate outdoors to the open air or to a stack type air admittance valve in accordance with Section 917. 

2. IRC P3102.3 (Supp) Vent termination. Every vent stack or stack vent shall terminate outdoors to the open air or terminate to a stack type air admittance valve in accordance with Section P3114.1. 

Proponent’s Reason: This code change simply expands the use of air admittance valves (AAVs) to stack applications. The valves operate exactly the same in stack and branch installations. They open under negative pressure, allowing air to enter the system, and close under neutral or positive pressure conditions, preventing sewer gases from escaping from the valve. The one open pipe vent required on every building drainage system in accordance with Section 917.7 will relieve any positive pressure. The performance standard for stack type devices is ASSE 1050. It was developed through the consensus process, the same as ANSI/ASSE 1051 for single fixture and branch devices, which is currently referenced in the code. There are benefits to stack venting versus branch venting. In some installations it is more economical since it allows for the venting of fixtures on multiple floors, thus reducing the number of valves required. It reduces fire-stopping requirements and roof penetrations. The only difference between branch and stack venting is the location of the valve. The performance standard limits the use of stack type AAVs to drainage stacks 6 branch intervals (7 floors) or less in height. Stack type air admittance valves have a longer history of use than individual and branch type AAVs. In Europe, where AAVs have been used for 29 years, the majority of installations (approximately 80%) are stack applications. They have been field tested in stack applications worldwide. This code change will expand the use of AAV’s and reduce the cost of construction without jeopardizing the health, safety and welfare of the public. The 2000 IRC already allows for stack venting with AAV’s. 

ITEM 1 (IPC) 
Committee Action: Disapproved 

Committee Reason: Based on previous action taken on P95-02. 

Assembly Action: No Motion 

ITEM 2 (IRC) 
Committee Action: Approved as Submitted 

Committee Reason: Based on proponent’s published reason. 

Assembly Action: No Motion 

Individual Consideration Agenda 

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and a public comment was submitted. 

Public Comment: 
Jack Beuschel, representing Studor Inc., requests Approved as Submitted for Items 1 and 2.

Commenter's Reason: This is a companion change to P95-02. The ICC rules and regulations do not require that the reference standard ASSE 1050 for stack type AAVs must be an ANSI approved standard. However, I expect that the revision will be completed and 1050 published as an ANSI/ASSE Standard prior to the public comment hearing.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
- Item 1 D  Item 2 D
- Item 1 AS  Item 2 AS

**P90-02**

909.1 (IRC P3108.1)

**Proposed Change as Submitted:**

**Proponent:** Steve Yunker, representing the SBCCI Plumbing Code Action Committee

**Analysis:** The following combinations of actions would achieve technical consistency between the IPC and the IRC:
- Item 1 D  Item 2 D
- Item 1 AS  Item 2 AS

**ITEM 1 (IPC)**

Committee Action: Disapproved

Committee Reason: The proposed text is confusing and the committee preferred existing text.

Assembly Action: No Motion

**ITEM 2 (IRC)**

Committee Action: Approved as Submitted

Committee Reason: The proposed text adds clarity to the intent of this section.

Assembly Action: Disapproved - Motion Failed

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code and an assembly action was successful.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
- Item 1 D  Item 2 D
- Item 1 AS  Item 2 AS

**P92-02**

912.2.2 (IRC P3111.2.2)

**Proposed Change as Submitted:**

**Proponent:** Paul R. Frost, City of Southfield, MI, representing the Code Study and Development Committee of Southeastern Michigan

**Analysis:** Single fixtures connected separately to the building drain a minimum of ten pipe diameters
downstream from the base of any stack shall not require a dry vent.

2. IRC P3111.2.2 Connection. The combination waste and vent pipe shall connect to a horizontal drain that is vented or a vent shall connect to the combination waste and vent. The vent connecting to the combination waste and vent pipe shall extend vertically a minimum of 6 inches (152 mm) above the flood level rim of the highest fixture being vented before offsetting horizontally.

Exception: Single fixtures connected separately to the building drain a minimum of ten pipe diameters downstream from the base of any stack shall not require a dry vent.

Proponent’s Reason: When changes were made to this section of the 2000 code, users of the IPC lost one of the oldest methods of connecting fixtures to the lowest portion of piping in a building. Permitted practice in many areas of the country, and in the State of Michigan with code text dating back to 1954, this method has been proven by successful installations in thousands of buildings. The requirement to now add a dry vent to stand alone fixtures or traps is an unnecessary burden and design nightmare. Technical support for this proposal answers the tough questions about extreme flow conditions and pressure changes in the building drain. It’s important to recognize the proposal does not change any of the limitations for the type of fixtures permitted by Section 912; also the requirement for a dry vent for combination systems of multiple fixtures is not affected. The proposal provides considerable cost savings, design flexibility and removes unnecessary restrictions with no increased risk.

ITEM 1 (IPC)
Committee Action: Approved as Modified

Modify proposal as follows:

912.2.2 Connection. The combination drain and vent system shall be provided with a dry vent connected at any point within the system, shall connect to a horizontal drain that is vented in accordance with one of the venting methods specified in this chapter, or shall connect to a building drain as a horizontal branch in accordance with Section 704.3. The vent connection to the combination drain and vent pipe shall extend vertically a minimum of 6 inches (152 mm) above the flood level rim of the highest fixture being vented before offsetting horizontally.

Exception: Single fixtures of the type specified in Section 912.1, connected separately to the building drain a minimum of ten pipe diameters downstream from the base of any stack shall not require a dry vent.

Committee Reason: Based on proponent’s published reason. The modification limits the fixtures to those already specified for combination drain and vent systems.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Judson W. Collins, Oklahoma State Health Department, Health Facilities Plan Review, requests Approved as Modified by this comment.

Modify proposal as follows:

912.2.2 Connection. The combination drain and vent system shall be provided with a dry vent connected at any point within the system, shall connect to a horizontal drain that is vented in accordance with one of the venting methods specified in this chapter, or shall connect to a building drain as a horizontal branch downstream from the base of any stack shall not require a dry vent.

Exception: Single fixtures connected separately to the building drain a minimum of ten pipe diameters downstream from the base of any stack shall not require a dry vent.

Commenter’s Reason: This proposed modification to the language recommended by the code change committee does the same thing without having an exception. Exceptions are contrary to the format preferred in the ICC Style Manual. The proposed language also clarifies that a building drain, receiving only the waste from stacks, is considered to be a horizontal vented drain. By making the connection not less than ten pipe diameters of the stack downstream from the stack, the previous concerns with this section have been addressed. The stricken sentence in the body of the section was proposed by me in a previous code change cycle to take care of a perceived problem with the text. However, this proposed modification takes care of the previous problem and also addresses the proponents intention that connections of combination drain and vent systems can be made to a building drain receiving only the wastes from stacks. The original proponent of this change limited the connection(s) to a single fixture. There is no reason that it must be limited to single fixtures as long as any connection complies with the sizing and slope requirements for combination drain and vent systems.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
Item 1 AS Item 2 AS
or
Item 1 AMPC Item 2 AMPC
or
Item 1 D Item 2 D

P94-02
914
Proposed Change as Submitted:

**Proponent:** Curtis Ray, CPO, President, Philadelphia Chapter of ASPE

Add new text as follows:

**SECTION 914
PHILADELPHIA SINGLE STACK VENT SYSTEM**

**914.1 Where permitted.** The drainage stack shall be permitted to serve as a Philadelphia single stack vent system when designed and installed in accordance with Sections 914.2 through 914.7. The drainage stack in a Philadelphia single stack vent system shall be considered the vent for the plumbing fixtures.

**914.2 Stack size.** The drainage stack shall be sized in accordance with Table 914.2. Where three or more water closets connect to the stack, the minimum size of the stack shall be 4 inch.

<table>
<thead>
<tr>
<th>Stack Size (inches)</th>
<th>Maximum Connected Drainage Fixture Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>75</td>
</tr>
<tr>
<td>4</td>
<td>225</td>
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<tr>
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<td>12</td>
<td>8100</td>
</tr>
<tr>
<td>15</td>
<td>13,600</td>
</tr>
</tbody>
</table>

**914.3 Branch size.** Horizontal branches connecting to the Philadelphia single stack vent system shall be sized in accordance with Table 710.1(2).

**914.4 Stack vent.** The drainage stack shall have a stack vent that terminates to the outdoor air. The stack vent shall be the same size as the drainage stack in the Philadelphia single stack vent system.

**914.5 Distance from trap to vent.** The maximum distance from a water closet connection to the stack shall be 4 feet. When the horizontal branch connects to the stack through a sanitary tee, the maximum distance from a water closet connection to the stack shall be 8 feet. The maximum distance from fixture traps, other than water closets, shall be 12 feet. The vertical section (drop from a fixture trap) of the horizontal branch shall not be included when measuring the distance from trap to stack. When the distance from the fixture traps or water closet connection exceeds the allowable distance to the stack, additional venting of the horizontal branch shall be provided in accordance with Section 914.6.

**914.5.1 Maximum vertical drop.** The maximum vertical section of a horizontal fixture drain connecting to a horizontal branch shall be 4 feet. The minimum size of a vertical section of the horizontal branch shall be 2 inch. When the vertical section exceeds 4 feet in length, the fixture shall be individually or common vented.

**914.6 Additional venting.** When two or more water closets connect to a horizontal branch, or where the distance from trap to vent specified in Section 914.5 is exceeded, additional venting shall be provided on the horizontal branch. The fixture(s) shall be vented by individual vent, common vent, wet vent, circuit vent, or combination drain and vent. The dry vent extension for the additional venting means shall connect to a branch vent, vent stack, stack vent, or air admittance valve.

**914.7 Stack offset.** Horizontal offsets of the stack in a Philadelphia single stack vent system shall be vented in accordance with Section 915.2 and 915.3. Where no additional fixtures connect to the Philadelphia single stack vent system below a horizontal offset of the stack, the venting of the offset shall not be required. The stack vent connection of the Philadelphia single stack vent system shall be permitted to be horizontally or vertically offset without venting of the offset.

(Renumber remaining sections)

**Proponent’s Reason:** The oldest existing records on file indicate that the General Assembly of the State of Pennsylvania authorized first class cities, which included Philadelphia, to enact rules and regulations governing the installation of plumbing and the examination and licensing of plumbers. This dates back to June 30, 1885.

The next substantial plumbing code enacted under this authority was January 1, 1912. Needless to say it has been revised many times since then in order to continuously modernize and update our plumbing code.

The single stack, or commonly known Philadelphia system, is based on the theory that the drain lines that are to be installed are of sufficient
The air and the most

Philadelphia has over 100 years of experience using the single stack system. This system has been proven effective by computer modeling at Herriot-Watt University in Scotland.

The basic concept used for this system is the over sizing of the stack (and occasionally, the horizontal branch). By over sizing the piping system, the pressure differentials are less than plus or minus one inch of a water column.

When more than one water closet connects to a horizontal branch, additional venting is required. The stack cannot serve as the vent of the fixtures. Similarly, when the distance from stack to vent is exceeded, another venting means must be provided for the fixtures.

This system has proven to be less expensive and safe to use. With Philadelphia moving to the IPC, it is important for the code to retain this historical venting method.

Committee Action: Disapproved

Committee Reason: The proposed text is confusing and appears the venting method is similar to waste stack venting already included in Chapter 9.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:


Commenter’s Reason: The Philadelphia Single Stack venting method has been used successfully in the City of Philadelphia for many years. The Philadelphia Chapter of ASPE did an excellent job of coordinating the requirements in the IPC. It is unfortunate that the Code Committee did not provide any valid technical reason for not excepting this method of venting. While the Committee stated that the section is confusing, I find no confusion in the text. The requirements are straightforward, written in code mandatory language, and readily understood by anyone in the profession.

Although the Philadelphia Single Stack is similar to the waste stack vent, it is not the same. The Philadelphia Single Stack permits the discharge of any fixture, while the waste stack vent limits the types of fixtures discharging. Once approved, the Philadelphia Single Stack will most likely replace the waste stack vent system for single stack venting, since this venting method is less restrictive.

It should also be recognized that ASPE publishes information regarding the Philadelphia Single Stack in their Data Book Volume 2.

Proposed Change as Submitted:

Proponent: Jack Beuschel, representing Studor, Inc.

Revise as follows:

917.1 General. Vent systems utilizing air admittance valves shall comply with this section. Stack type air admittance valves shall conform to ASSE 1050. Individual and branch type air admittance valves shall conform to ASSE 1051.

917.2 Installation. The valves shall be installed in accordance with the requirements of this section and the manufacturer’s installation instructions. Air admittance valves shall be installed after the DWV testing required by 312.2 or 312.3 has been performed.

917.3 Where permitted. Individual, branch and circuit vents shall be permitted to terminate with a connection to an individual or branch type air admittance valve. Stack vents and vent stacks shall be permitted to terminate to stack type air admittance valves. The Individual and branch type air admittance valves shall only vent fixtures that are on the same floor level and connect to a horizontal branch drain. The horizontal branch drain having individual and branch type air admittance valves shall conform to 917.3.1 or 917.3.2. Stack type air admittance valves shall conform to Section 917.3.3.

917.3.1 Location of branch. The horizontal branch drain shall connect to the drainage stack or building drain a maximum of four branch intervals from the top of the stack.

917.3.2 Relief vent. The horizontal branch shall be provided with a relief vent that shall connect to a vent stack, or stack vent, or extend outdoors to the open air. The relief vent shall connect to the horizontal branch drain between the stack or building drain and the most downstream fixture drain connected to the horizontal branch drain. The relief vent shall be sized in accordance with 916.2 and installed in accordance with 905. The relief vent shall be permitted to serve as the vent for other fixtures.

917.3.3 Stack. Stack type air admittance valves shall serve as the vent terminal for vent stacks or stack vent for drainage stacks not exceeding 6 branch intervals.

917.4 Location. The Individual and Branch type air admittance valves shall be located a minimum of 4 inches (102 mm) above the horizontal branch drain or fixture drain being vented. Stack type air admittance valves shall be located a minimum of 6 inches above the flood level rim of the highest fixture being vented. The air admittance valve shall be located within the maximum developed length permitted for the vent. The air admittance valve shall be installed a minimum of 6
inches (152 mm) above insulation materials.

(No change to remaining sections)

Proponent's Reason: This code change simply expands the use of air admittance valves (AAVs) to stack applications. The valves operate exactly the same in stack and branch installations. They open under negative pressure, allowing air to enter the system, and close under neutral or positive pressure conditions, preventing sewer gases from escaping from the valve. The one open pipe vent required on every building drainage system in accordance with Section 917.7 will relieve any positive pressure. The performance standard for stack type devices is ASSE 1050. It was developed through the consensus process, the same as ANSI/ASSE 1051 for single fixture and branch devices, which is currently referenced in the code. There are benefits to stack venting versus branch venting. In some installations it is more economical since it allows for the venting of fixtures on multiple floors, thus reducing the number of valves required. It reduces fire-stopping requirements and roof penetrations. The only difference between branch and stack venting is the location of the valve. The standard limits the use of stack type AAVs to drainage stacks 6 branch intervals (7 floors) or less in height. Stack type air admittance valves have a longer history of use than individual and branch type AAVs. In Europe, where AAVs have been used for 29 years, the majority of installations (approximately 80%) are stack applications. They have been field tested in stack applications worldwide. This code change will expand the use of AAVs and reduce the cost of construction without jeopardizing the health, safety and welfare of the public. This change is also a correlation change to the 2000 IRC, which allows for stack venting with AAV’s.

Committee Action: Disapproved

Committee Reason: The proposed text is premature in that the standard referenced is currently under revision and is not ANSI approved.

Assembly Action: Approved as Submitted-Motion Failed

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jack Beuschel, Studor Inc., requests Approved as Submitted.

Commenter's Reason: This is a companion change to P89-02. The ICC rules and regulations do not require that the reference standard ASSE 1050 for stack type AAVs must be an ANSI approved standard. However, I expect that the revision will be completed and 1050 published as an ANSI/ASSE Standard prior to the public comment hearing.

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P96-02

917.8

Proposed Change as Submitted:

Proponent: Jack Beuschel, representing Studor, Inc.

Revise as follows:

917.8 Prohibited installations. Air admittance valves shall not be installed in nonneutralized special waste systems as described in Chapter 8. Valves shall not be located in spaces utilized as supply or return air plenums.

Exception: Air admittance valves shall be permitted in nonneutralized special waste systems provided they conform to the material requirements of Section 702.5.

Proponent’s Reason: The IPC approves the use of air admittance valves (AAV’s) for single fixture and branch venting. Their use has been prohibited in supply or return air plenums since the materials commonly used to manufacture AAVs are ABS and PVC. These plastics are not chemical or acid resistant. For example, Teflon® is a material that is very resistant to chemicals and acids. It is comparable to borosilicate glass, which is permitted in special waste systems. This code change will permit the use of AAVs manufactured from Teflon® or other acid and chemical resistant material to be installed in nonneutralized special waste systems. These systems are very difficult to vent to the atmosphere since the fixtures are generally located in islands.

Committee Action: Disapproved

Committee Reason: The proposed text is premature in that a standard is not available for the design and testing of these devices located in chemical waste systems. The standard should address both the material and application performance requirements where such devices are utilized.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jack Beuschel, Studor Inc., requests Approved as Submitted.

Commenter's Reason: The standard which is applicable is ANSI/ASSE 1051 which is the performance standard for AAVs in fixture and branch applications. This standard is referenced in the IPC. With regards to material requirements, Section 702.5 states that materials used to vent chemical waste systems shall be of an approved material that is resistant to corrosion and degradation for the concentrations of chemicals involved. Therefore AAVS manufactured from material that meets the criteria of Section 702.5 should be approved for installation in chemical waste systems as an exception to Section 917.8.

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P97-02

917.8 (IRC P3114.5)

Proposed Change as Submitted:
Proponent: Jack Beuschel, representing Studor, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IPC 917.8 Prohibited installations. Air admittance valves shall not be installed in nonneutralized special waste systems as described in Chapter 8. Valves shall not be located in spaces utilized as supply or return air plenums.

   Exception: Air admittance valves shall be permitted in spaces utilized as supply or return air plenums provided the valves have a peak rate of heat release not greater than 100 kilowatts, a peak optical density not greater than 0.50, and an average optical density not greater than 0.15 when tested in accordance with UL 2043.

Add referenced standard as follows:

CHAPTER 13
REFERRED STANDARDS

UL 2043 Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces 917.8

2. IRC P3114.5 Access and ventilation. Access shall be provided all air admittance valves. The valve shall be located within a ventilated space that allows air to enter the valve. Air admittance valves shall be permitted in spaces utilized as supply or return air plenums provided the valves have a peak rate of heat release not greater than 0.50, and an average optical density not greater than 0.15 when tested in accordance with UL 2043.

Add referenced standard as follows:

CHAPTER 43
REFERRED STANDARDS

UL 2043 Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces P3114.5

Proponent’s Reason: The IPC approves the use of air admittance valves (AAVS) for single fixture and branch venting. Their installation has been prohibited in supply or return air plenums since the materials commonly used to manufacture AAVS are ABS and PVC. These are combustible materials that are generally not used in exposed applications within plenums due to their combustion (heat/smoke) characteristics.

The title of UL 2043 is Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-handling Spaces. AAVS are discrete products (as opposed to continuous piping, ducting, insulation, etc.). As such, a test method such as UL 2043 is an appropriate test. The test places limits on heat released and smoke generated when the discrete part is exposed to a large (approximately 60 kilowatt) sand burner flame for 10 minutes. Since the risk of a fire starting within an AAV is zero, a test that simulates response to a larger external fire is a better model to use when evaluating performance. Both the National Electrical Code and the International Mechanical Code recognize this type of test for discrete products. The IMC does so explicitly in Section 602.2.1.4 - Requirements for Combustible Electrical Equipment in Plenums.

In commercial applications the installation of AAVS in plenums will provide significant economic benefits versus open pipe vents without jeopardizing the health and safety of the public.

ITEM 1 (IPC)

Committee Action: Disapproved

Committee Reason: The justification for the proposal lacks technical substantiation and is therefore insufficient to warrant this change. In addition, the standard referenced only relates to the product itself and the piping connected thereto would also need to meet the requirements of UL 2043.

Assembly Action: No Motion

ITEM 2 (IRC)

Committee Action: Disapproved

Committee Reason: The committee had some concerns over the installation of these devices in supply and return air plenums which include the effect of positive and negative pressures that occur in such areas.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jack Beuschel, Studor Inc., requests Approved as Submitted for Items 1 and 2.

Commenter's Reason: It is difficult to comment on the committee’s reason for denial (“...the proposal lacks technical substantiation”) without quantifying what technical substantiation was lacking. The code change included a copy of Standard UL 2043 which is a fire test for heat and visible smoke release for discrete products and their accessories installed in air-handling spaces. This standard is referenced in Section 602.2.1.4 in the IMC. Therefore AAVS manufactured from material that meets UL 2043 should be approved for installation in plenums as an exception to Section 917.8. Further, the piping to which the valve would be connected when installed in the plenum would be a material approved for installation in plenums. The IRC Committee had some concerns that the positive and negative pressures in a plenum could affect the operation of the valve. SGS U.S. Testing Company Inc. has performed tests on 2 types of AAVS to evaluate their ability to function in supply and return air plenums. They determined that a pressure differential between the plenum space and the DWV system of 0.30 inch of water column (WC) was required to unseat the diaphragm. The
ANSI/ASSE performance pressure requires that AAVS open at a maximum negative pressure of 0.30" WC.

Therefore, since the maximum pressure differential in a supply and return air plenum will not exceed plus or minus 0.10" water column the operation of the valve will not be affected.

Analysis: The following combinations of actions would achieve technical consistency between the IPC and the IRC:
Item 1 AS Item 2 AS
or
Item 1 D item 2 D

P98-02
1002.1 (IRC P3201.6)

Proposed Change as Submitted:

Proponent: James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association & Virginia Building Code Official Association

THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IPC 1002.1 Fixture traps. Each plumbing fixture shall be separately trapped by a water–seal trap, except as otherwise permitted by this code. The trap shall be placed as close as possible to the fixture outlet. The vertical distance from the fixture outlet to the trap weir shall not exceed 24 inches (610 mm) and the horizontal distance shall not exceed 30 inches (610 mm). The distance of a clothes washer standpipe above a trap shall conform to Section 802.4. A fixture shall not be double trapped.

(No change to exceptions)

2. IRC P3201.6 Number of fixtures per trap. Each plumbing fixture shall be separately trapped by a water seal trap placed as close as possible to the fixture outlet. The vertical distance for the fixture outlet to the trap weir shall not exceed 24 inches (610 mm) and the horizontal distance shall not exceed 30 inches (610 mm). The distance of a clothes washer standpipe above a trap shall conform to Section P2706.2.

(No change to exceptions)

Proponent’s Reason: Current code text does not provide any horizontal distance limit from the fixture outlet to the trap. The proposed 30 inch total developed length corresponds to the exception in this section.

ITEM 1 (IPC)

Committee Action: Disapproved
Committee Reason: The proposed text is overly restrictive and the justification for the proposal lacks technical substantiation and is therefore insufficient to warrant this change.

Assembly Action: No Motion

ITEM 2 (IRC)
Committee Action: Disapproved
Committee Reason: The proposed text is overly restrictive and the justification for the proposal lacks technical substantiation and is therefore insufficient to warrant this change.

Assembly Action: Approved as Submitted— Motion Failed

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

James Anjam, Arlington County, VA, representing Virginia Plumbing and Mechanical Inspectors Association/ Virginia Building Code Official Association, requests Approved as Submitted for Items 1 and 2.

Commenter’s Reason: The committee’s reason to disapprove this change was that the proposed language is overly restrictive. The proposed 30 inch horizontal limit is already part of the code for multi compartment sinks. The horizontal distance limit in Section 802.2 for the indirect waste piping is set at 2 feet. The current code, does not provide any horizontal distance limit from the fixture outlet to the trap. You can run the waste pipe from the fixture outlet to the trap an unlimited distance.

Analysis: The following combinations of actions would achieve technical consistency between the and the IRC:
Item 1 D Item 2 D
or
Item 1 AS item 2 AS

P99-02
1002.4 (IRC P3201.3)

Proposed Change as Submitted:


THIS PROPOSAL IS ON THE AGENDA OF THE IPC AND THE IRC PLUMBING CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:
1. **IPC 1002.4 (Supp) Trap seals.** Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm), or deeper for special designs relating to accessible fixtures. Where a trap seal is subject to loss by evaporation, a deep-seal trap consisting of a 4-inch (102 mm) seal or a trap seal primer valve shall be installed. A trap seal primer valve shall conform to ASSE 1018 or ASSE 1044. In addition to the deep seal trap or the primer, the installation of a sealing component on the trap inlet which allows fluid flow and a positive seal against evaporation shall also be permitted.

2. **IRC P3201.3 Trap setting and protection.** Traps shall be set level with respect to their water seals and shall be protected from freezing. Trap seals shall be protected from siphonage, aspiration or back pressure by an approved system of venting (see Section P3101). Floor drains shall be protected from evaporation by the installation of a deep seal trap, a trap primer or a sealing component on the trap inlet which allows fluid flow and a positive seal against evaporation.

   **Proponent’s Reason:** The installation of secondary devices which assist in maintaining the trap seal should be permitted by the code and protected against evaporation.

   **Analysis:** The additional language does not specify a standard to which the sealing component must comply with or when this mechanism is permitted.

**ITEM 1 (IPC)**

**Committee Action:** Disapproved

**Committee Reason:** The proposed text is unclear as to what constitutes a sealing mechanism. In addition, a standard was not referenced for such devices or where this mechanism is permitted.

**Assembly Action:** No Motion

**ITEM 2 (IRC)**

**Committee Action:** Disapproved

**Committee Reason:** The proposed text is unclear as to what constitutes a sealing mechanism. In addition, a standard was not referenced for such devices or where this mechanism is permitted.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C., representing Sure-Seal, requests Approved as Modified by this comment.

**Proposed Change as Submitted:**

1. **IPC 1002.4 (Supp) Trap seals.** Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm), or deeper for special designs relating to accessible fixtures. Where a trap seal is subject to loss by evaporation, a deep-seal trap consisting of a 4-inch (102 mm) seal or a trap seal primer valve shall be installed. A trap seal primer valve shall conform to ASSE 1018 or ASSE 1044. In addition to the deep seal trap or the primer, the installation of a sealing component on the trap inlet which allows fluid flow and a positive seal against evaporation shall also be permitted.

**Commenter’s Reason:** This modification will clarify the original intent of the code change. There are sealing components that greatly reduce the evaporation of a floor drain trap seal. One of the questions that arises is whether the code will allow these components to be installed. The components are listed by a third party agency for this application. The sealing components are serving as a secondary level of protection to a trap seal primer.

Sure Seal is one of the manufacturers of sealing components for floor drains.

**Analysis:** The following combinations of actions would achieve technical consistency between the IPC and the IRC:

- Item 1 AS  Item 2 AS
- Item 1 AMPC  Item 2 AMPC

**P100-02**

**1003.3**

**Proposed Change as Submitted:**

**Propponent:** Patrick J. Higgins, P.J. Higgins & Associates, Inc.

**Revise as follows:**

**1003.3 Grease traps.** Grease traps shall conform to PDI G101, ASME A112.14.3 or ASME A112.14.4 and shall be installed in accordance with the manufacturer’s instructions.

**Proponent’s Reason:** These two new ASME standards address performance requirements for grease interceptors and grease recovery devices. The basic criteria for these standards started with the PDI G101 as the nucleus document, and with the assistance of the Plumbing and Drainage Institute, were expanded to include the latest technology.

**Analysis:** The proponent had not submitted the referenced standards for review prior to the printing of the monograph. If the standards are
submitted within a reasonable time frame, staff will review them and provide the results to the committee members prior to the code hearings.

**Committee Action:** Disapproved

**Committee Reason:** The proposed standard and definition of a grease trap conflict with the type of device specified in the standard.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Wayne Harrison, Josam Company, requests Approved as Modified by this comment.

Modify proposal as follows:

1003.3 Grease traps, traps, and interceptors. Grease traps, traps, and interceptors shall conform to PDI G101, ASME A112.14.3-00 or ASME A112.14.4-01 and shall be installed in accordance with the manufacturer’s instructions.

**Commenter’s Reason:** Results of staff review for the Pittsburgh meeting of Standards ASME 14.3 and 14.4 for the *International Plumbing Code* were “Acceptable.” “Acceptable” signifies that the standard did meet the requirements of Section 3.6 of the ICC Code Development process.

The committee’s reason for disapproval has been addressed by the proposed modification.

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**P102-02**

1003.2

**Proposed Change as Submitted:**

**Proponents:** Brien Bellous, City of Columbus, OH

Ronald L. George, CIPE, CPD, Smith Group, Inc., Architects/Engineers, representing Code Study and Development Committee of SE Michigan

**Revise as follows:**

1003.3.2 Food waste grinders. Where food waste grinders connect to grease traps or grease interceptors, a solids interceptor shall separate the discharge before connecting to the grease trap. Solids interceptors and grease interceptors shall be sized and rated for the discharge of the food waste grinder.

**Proponent’s Reason:** (Bellous) Solid food waste, such as from a garbage disposal, interferes with the proper operation of a grease trap (PDI rated, flows of 50gpm or less.) Food waste clogs the baffle system and prevents proper grease separation and retention from the waste stream. All grease traps must conform to the PDI standard, and PDI states that it is important to intercept grinder discharge before it enters the grease trap. Major manufacturers, such as Zum also state that food grinder waste should be separated before entering the grease trap for proper operation of the unit.

( George) Manufacturers make a solids interceptor to remove solids from food waste grinders. Manufacturers have indicated the grease adheres to solids from a food waste grinder and either plug-up or pass through the grease interceptor carrying the grease with it. This code change addresses solids interceptors that are an option to an oversized grease interceptor. Many local codes do not allow food waste grinders to flow through a grease interceptor because of problems associated with the solids. This causes grease and large quantities of solids to discharge to the public sewer and in some cases it causes problems with blockages in the public sewers.

**Analysis:** Consistent action should be considered for related proposals P101-02 and P103-02.

**Committee Action:** Disapproved

**Committee Reason:** The proposed text is unclear as to why the term grease interceptor is deleted and then reinserted for purposes of sizing and rating for the discharge of the food waste grinder.

**Assembly Action:** Approved as Submitted

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because an assembly action was successful and a public comment was submitted.

**Public Comment:**

Brien L. Bellous, City of Columbus, Ohio, requests Approved as Submitted.

**Commenter’s Reason:** Allowing garbage disposals to discharge (unrestricted) through a PDI rated and approved grease trap causes the unit to become fouled with solid material and ultimately leads to failure of the devices’ ability to separate and retain grease from the waste stream. When solids are retained in the grease trap, grease particles begin to adhere to the material and form blockages to the waste stream and grease separation area of the “trap”. This performance issue is widely documented by manufacturers and the Plumbing Drainage Institute, and is the reason that both entities do not recommend that solid waste be allowed to enter the waste stream of the grease trap. Code change P102-02 merely reflects the industry standard and requires that garbage disposals be discharged through a solids interceptor before entering the grease trap. This not only allows the performance of the trap to be maintained, but addresses the main grease-producing problem for sewer systems in our country, solid food wastes. By definition, there are major differences between grease traps and grease interceptors in the plumbing code. The IPC committee did not recognize this difference and stated in their reason for disapproval that the code change conflicted with itself in that the last sentence allowed a grease interceptor to be sized and rated for the discharge of the food waste grinder. The issue addressed by the code change is that PDI rated units cannot receive solid food waste without performance and grease retention capability being adversely affected. Grease interceptors are large units of 500-2000 gallon capacities that receive more than 50 gallons per minute of flow, and are generally located outside the building. These interceptors have enough capacity that the unit can absorb some solid discharge; thus the reference that the design professional must size them accordingly. Grease traps are very precise units that require all integral parts and vents to be in unrestricted working order. I encourage the membership to approve this code change as submitted and uphold the assembly action in Pittsburgh. This
will assure that the performance and efficiency of PDI rated grease traps will be maintained and protected.

P106-02
1005

Proposed Change as Submitted:

Proponent: Billy Smith, Engineering Manager, representing Jay R. Smith Mfg. Company

Add new text as follows:

SECTION 1005
PRETREATMENT SYSTEMS

1005.1 Purpose. The purpose of this section is to provide the necessary criteria for the sizing, application and installation of pretreatment systems designated as a pretreatment or discharge water quality compliance strategy. Pretreatment systems are designed to provide the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater released to a treatment facility.

1005.2 Scope. Pretreatment systems shall be considered engineered systems and shall comply with the requirements of the manufacturer and include but, are not limited to:
FOG disposal systems, air flotation systems, gravity separation, chemical flocculation, filtration systems, coalescence, thermal flocculation, membrane processes, biological processes, carbon adsorption and encapsulation processes

1005.3 Components, materials and equipment. Pretreatment systems, including all components, materials and equipment necessary for the proper function of the system, shall comply with the manufacturers’ requirements

1005.4 Sizing, Application and Installation. Pretreatment systems shall be engineered, sized, and installed in accordance with the manufacturer’s specifications.

1005.5 Performance. Pretreatment systems shall be tested and certified as required in this code or other national consensus standards, local codes, and national requirements applicable to the particular pollutant(s) contained in wastewater requiring pretreatment prior to release to a treatment facility.

Public Comment 1:
Judson W. Collins, Oklahoma State Health Department, Health Facilities Plan Review, requests Disapproved.

Commenter’s Reason: The proposed text in Sections 1005.1 and 1005.2 is nothing more than commentary and does not belong in the code. Pretreatment systems are not defined in the code and the types of pretreatment systems named in Section 1005.2 are not defined. Section 1005.3 requires the systems to comply with the manufacturers requirements. Is there a standard for these systems or must we rely on the manufacturer to tell us how they want the system to operate which could be in violation of other provisions in the code. Section 1005.4 also addresses manufacturers specifications that the engineer must use, which again could violate other provisions of the code. Section 1005.6 requires testing and certification in accordance with the code or other national consensus standards, local codes, and national requirements. If there are consensus standards or national requirements for these systems, they should be included in this code. The proponent’s Reason 6 addresses inspection by the designer or manufacturer of the system. There are not any requirements for such an inspection. These systems may need to be addressed in the code but the proposed code change does not conform to the format and style of the rest of the code. The proponent needs to address definitions, standards (if any exist) and propose only requirements for inclusion in the code in proper code format and style.

Public Comment 2:
Joel E. Shelton, State of Oklahoma, representing Oklahoma State Department of Health, requests
Disapproved.

Commenter's Reason: Pretreatment systems are not within the scope of the plumbing code. The provisions for these systems should be enforced by the state and local treatment facilities that are required to develop pretreatment programs to regulate industrial discharges into their systems. The EPA Office of Wastewater Enforcement and compliance report 1992 “EPA Model Pretreatment ordinance” already provides the provisions and guidelines for such treatment. It should be left to each individual State to implement and enforce a pretreatment program that fulfills the requirements set out in the Code of Federal Regulations (CFR). Each municipality must consider state law to determine what adjustments may need to be made when crafting its legal authority.

Public Comment 3:


Commenter's Reason: I support the committee action recognizing the need for inclusion of advanced pretreatment technologies in the code and the necessity of distinguishing those technologies from conventional products such as grease traps and grease interceptors.

Public Comment 4:


Commenter's Reason: I support the committee action recognizing the need for inclusion of advanced pretreatment technologies in the code and the necessity of distinguishing those technologies from conventional products such as grease traps and grease interceptors.

PSD1-02

102.4

Proposed Change as Submitted:

Proponent: John Terry, representing the International Existing Building Code Drafting Committee

Delete and substitute as follows:

102.4 Additions, alterations or repairs. Additions, alterations, renovations or repairs to any private sewage disposal system shall conform to that required for a new system without requiring the existing system to comply with all the requirements of this code. Additions, alterations or repairs shall not cause an existing system to become unsafe, insanitary or overloaded.

Minor additions, alterations, renovations and repairs to existing systems shall be permitted in the same manner and arrangement as in the existing system, provided that such repairs or replacement are not hazardous and are approved.

Additions, alterations, renovations and repairs to private sewage disposal systems shall comply with the provisions of the International Existing Building Code and this code, as applicable.

102.5 Change in occupancy: it shall be unlawful to make any change in the occupancy of any structure that will subject the structure to any special provision of this code without approval of the code official. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new occupancy and that such change of occupancy does not result in any hazard to the public health, safety or welfare. The provisions of the International Existing Building Code shall apply to change of occupancy.

102.6 Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings. The provisions of the International Existing Building Code shall apply to historic buildings.

Revise as follows:

102.9 Requirements not covered by code. Any requirements necessary for the proper operation of an existing or proposed private sewage disposal system, or for the public safety, health and general welfare, not specifically covered by this code or the International Existing Building Code, shall be determined by the code official.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the International Building Code, or the International Plumbing Code or the International Existing Building Code, such terms shall have the meanings ascribed to them as in those codes.

Proponent's Reason: 1. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.

The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001

The proposed code change submitted here is a part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

2. 102.4: The IEBC addresses plumbing issues related to additions, alterations and repairs. The IEBC Drafting Committee after extensive discussions agreed on the goal that existing building provisions while providing for health and safety should also encourage the use and reuse of existing buildings. Accordingly Sections 401.2, 401.3, 410 (Repair), 501.2, 503.3 (Alteration level 1), 601.2, 610 (Alteration level 2), 701.2 (Alteration level 3), and 901.1 (Additions) address such issues.
Please note that the terms, “Addition”, “Alteration” and “Repair” are not defined in the IPSDC.

3. **102.5**: This section is revised to make reference to the IEBC. The IEBC contains comprehensive provisions for change of occupancy.

4. **102.6**: This section is revised to make reference to IEBC. The IEBC contains comprehensive provisions for historic buildings.

5. **102.9**: Reference to the IEBC is needed.

6. **201.3**: The International Existing Building Code is added as many terms related to existing buildings such as that discussed under 102.4 are found in the IEBC.

**Committee Action:** Disapproved

**Committee Reason:** Based on previous action taken on P1-02.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

John Terry, State of New Jersey, representing the IEBC Drafting Committee, requests Approved as Modified by this comment.

Modify proposal as follows:

102.4 **Additions, alterations or repairs.** Additions, alterations, renovations and repairs to private sewage disposal systems shall comply with the provisions of the International Existing Building Code and this code, as applicable.

102.5 **Change in occupancy.** The provisions of the International Existing Building Code shall apply to change of occupancy.

102.6 **Historic buildings.** The provisions of the International Existing Building Code shall apply to historic buildings.

102.9 **Requirements not covered by code.** Any requirements necessary for the proper operation of an existing or proposed private sewage disposal system, or for the public safety, health and general welfare, not specifically covered by this code or the International Existing Building Code, shall be determined by the code official.

201.3 **Terms defined in other codes.** Where terms are not defined in this code and are defined in the International Building Code, the International Plumbing Code or the International Existing Building Code, such terms shall have the meanings ascribed to them as in those codes.

**Commenter’s Reason:** The International Plumbing Code Development Committee disapproved the code change because: “Based on previous action taken on P1-02.”

The International Plumbing Code Development Committee disapproved P1-02 code change because: “The proposed text would reference the IEBC that is in the final draft stage and should reference the IBC because of conflicting sections between the two codes. In addition, the IEBC conflicts with Section 105.2 and 403.1 of the IPC.”

Section 102.6 Historic Buildings has been deleted as historic buildings are existing buildings and covered under the IEBC.

Contrary to the reported reason for Disapproval, the IEBC is, in fact, complete and is undergoing maintenance of provisions in the 2002 Cycle, just like all the I-codes. In recognition of this fact, the IBC General Committee approved code change proposal G133, that replaces the current text of 2000 IBC Chapter 34, Existing Structures, with a reference to the IEBC. The IEBC Drafting process was very similar to the process used to develop the IBC - a committee developed a draft(s) which was then exposed to the rigors of the ICC Code Development Process. The 2003 IEBC will be part of the 2003 family of International Codes. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings. The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001.

There were similar code changes proposed to the IBC for coordination with the IEBC that should eliminate any conflicts between the two codes, even though the committee did not provide specifics related to conflicts between the IEBC and IBC. There is no conflict between the IEBC and IPC Section 105.2. In fact the IEBC Section 104.11 (which is the same as the IBC Section 104.11) is the same as the IPC Section 105.2. The IPC Section 403.1 deals with the minimum number of plumbing fixtures. The IEBC requires the fixture count requirements of the IPC be complied with if the occupant load of any story is increased by more than 20 percent due to an alteration (IEBC Section 610) and requires fixture counts based on the IPC in a change of occupancy if the new occupancy requires more fixtures (IEBC Section 810). These requirements are certainly not a conflict with the IPC and in the case of alterations, there is only an additional flexibility provided in the IEBC.

The IEBC Drafting Committee respectfully requests the membership approval of this public comment (AM).
INTERNATIONAL MECHANICAL CODE

M1-02

101.2

Proposed Change as Submitted:

Proponent: John Terry, representing the International Existing Building Code Drafting Committee

Revise as follows:

101.2 Scope. This code shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed in herein. The installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be regulated by the International Fuel Gas Code. Repairs, alterations, or additions to mechanical systems in existing buildings shall also comply with the International Existing Building Code.

102.4 Additions, alterations or repairs. Additions, alterations, renovations or repairs to a mechanical system shall conform to that required for a new mechanical system without requiring the existing mechanical system to comply with all of the requirements of this code. Additions, alterations or repairs shall not cause an existing mechanical system to become unsafe, hazardous or overloaded.

Minor additions, alterations, renovations and repairs to existing mechanical systems shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system; is not hazardous and is approved.

Additions, alterations, renovations and repairs to mechanical systems shall comply with the provisions of the International Existing Building Code and this code, as applicable.

102.5 Change in occupancy. It shall be unlawful to make a change in the occupancy of any structure which will subject the structure to any special provision of this code applicable to the new occupancy without approval. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new occupancy and that such change of occupancy does not result in any hazard to the public health, safety or welfare. The provisions of the International Existing Building Code shall apply to all buildings undergoing a change of occupancy.

102.6 Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings. The provisions of the International Existing Building Code shall apply to historic buildings.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the International Building Code, ICC Electrical Code, International Fire Code, International Fuel Gas Code, or the International Plumbing Code or the International Existing Building Code, such terms shall have meanings ascribed to them as in those codes.

302.1 Structural safety. The building or structure shall not be weakened by the installation of mechanical systems. Where floors, walls, ceilings or any other portion of the building or structure are required to be altered or replaced in the process of installing or repairing any system, the building or structure shall be left in a safe structural condition in accordance with the International Existing Building Code.

CHAPTER 15
REFERRED STANDARDS

<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEBC-2003</td>
<td>International Existing Building Code</td>
</tr>
</tbody>
</table>

Proponent’s Reasons:

Reason: 1. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings.


The proposed code change submitted here is part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

2. 101.2: The reference to repair, alteration, etc. in the first and
second lines remain because there are still certain sections dealing with these subject present in the IMC. These sections remain in the IMC for mechanical professionals ease of access to such information. The last sentence related to existing buildings undergoing repairs, alterations, etc. and the reference to the IEBC is needed to refer the code user to mechanical requirements that might be triggered as a result of work performed under the jurisdiction of the IEBC. An example would be IEBC Section 609.2 where in buildings undergoing “Alterations Level 2”, a minimum amount of outdoor air and ventilation air is specified. The IEBC chapters have a cascading effect such that IEBC Section 609.2 is also applicable to buildings undergoing “Alterations Level 3” and “Change of Occupancy Classification”.

3. **102.4 :** The IEBC also addresses mechanical issues related to additions, alterations and repairs. The IEBC Drafting Committee after extensive discussions agreed on the goal that existing building provisions while providing for health and safety should also encourage the use and re-use of existing buildings. Accordingly Sections 401.2, 401.3, 409 (Repair), 501.2, 503.3 (Alteration level 1), 601.2, 609 (Alteration level 2), 701.2 (Alteration level 3), and 901.1 (Additions) address such issues.

4. **102.5 :** This section is revised to make reference to the IEBC. The IEBC contains comprehensive provisions for change of occupancy.

5. **102.6 :** This section is revised to make reference to IEBC. The IEBC contains comprehensive provisions for historic buildings.

6. **201.3 :** The *International Existing Building Code* is added as many terms related to existing buildings such as those discussed under 102.4 are found in the IEBC.

7. **Section 302.1 :** Any change or modification to walls, floors, ceiling and other building elements as a result of mechanical work, will create a category of work under the provisions of the IEBC and therefore a reference to the IEBC is needed to alert the code user to the possibility of requirements that might be triggered under the IEBC.

**Committee Action:** Disapproved

**Committee Reason:** It is premature to refer to a code that is not finalized.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

*John Terry, State of New Jersey, representing the IEBC Drafting Committee, requests Approved as Modified by this comment.*

**Modify proposal as follows:**

101.2 Scope. This code shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed in herein. The installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be regulated by the International Fuel Gas Code. Repairs, alterations, or additions to mechanical systems in existing buildings shall also comply with the **International Existing Building Code**.
Proposed Change as Submitted:

Proponent: ICC Ad Hoc Committee for Hydrogen Gas

THIS PROPOSAL IS ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IMC 304.3 Location Elevation of ignition source.
   Equipment and appliances having an ignition source and located in hazardous locations and public garages, private garages, repair garages, automotive service stations, and parking garages where flammable liquids or flammable gases heavier than air are present shall be elevated such that the source of ignition source is not less than 18 inches (457 mm) above the floor surface on which the equipment or appliance rests. Such equipment and appliances shall not be installed in Group H occupancies or control areas where open-use, handling or dispensing of combustible, flammable or explosive materials occurs. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Add new text as follows:

304.4 Hydrogen Generating and Refueling Operations. In rooms or spaces that contain hydrogen generating or refueling systems, equipment and appliances having an ignition source shall be located such that the ignition source is not less than 24 inches (457 mm) below the ceiling in hazardous locations and public garages, private garages, repair garages, automotive service stations and parking garages where gaseous hydrogen is present. Such equipment and appliances shall not be installed in Group H occupancies or control areas where open-use, handling or dispensing of combustible, flammable or explosive materials occurs. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Exceptions:
1. Where rooms or spaces that contain hydrogen generating or refueling systems are ventilated in accordance with Section 304.4.1

2. Where rooms or spaces that contain hydrogen generating or refueling systems are ventilated in accordance with Section 502.15 of the International Mechanical Code and the following:

   2.1. The ventilation system shall be designed to maintain the maximum concentration of flammable contaminants below 25 percent of the contaminant’s lower flammability limit; or

   2.2. Continuous ventilation shall be provided at a rate not less than 1 cubic foot per minute per square foot [(0.0051m³/(s x m²)] of floor area of the room.

3. Where rooms or areas that contain hydrogen generating or refueling systems are ventilated in accordance with Section 304.4.2

304.4.1 Natural Ventilation. Rooms or spaces located underneath or adjacent to habitable space and intended for hydrogen generating or refueling operations shall be provided with mechanical ventilation as required by the exception to Section 304.4 or shall communicate with the outdoors in accordance with Sections 304.4.1.1 through 304.4.1.2. The minimum cross-sectional dimension of air openings shall be 3 in. (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect.

304.4.1.1 Two openings. Two permanent openings, one commencing within 12 inches (305 mm) of the ceiling of the garage, and one commencing within 12 inches (305 mm) of the floor of the garage, shall be provided. The openings shall communicate directly, or by ducts, with the outdoors. Each opening shall directly communicate with the outdoors horizontally, and have a minimum free area of ½ square foot per 1,000 cubic feet of garage volume.

304.4.1.2 Louvers and grilles. In calculating free area required by Section 304.4.1.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Louvers and grilles shall be fixed in the open position.

304.4.2 Specially engineered installations. As an alternative to the provisions of Section 304.4.1, the necessary supply of air for, ventilation and dilution of
flammable gases shall be provided by an approved engineered system.

(Renumber remaining sections)

SECTION 202
GENERAL DEFINITIONS

HYDROGEN GENERATING APPLIANCE. A self-contained package or factory-matched packages of integrated systems for generating gaseous hydrogen. Hydrogen generating appliances utilize electrolysis, reformation, chemical, or other processes to generate hydrogen.

Revise as follows:

2. IRC 1307.3 Location Elevation of ignition source. Appliances having an ignition source shall be elevated such that the ignition source is not less than 18 inches (457 mm) above the floor in garages where flammable liquids or flammable gases heavier than air are present. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the garage.

Add new text as follows:

1307.4 Hydrogen Generating and Refueling Operations. In rooms or spaces that contain hydrogen generating or refueling systems, equipment and appliances having an ignition source shall be located such that the ignition source is not less than 24 inches (457 mm) below the ceiling in garages where gaseous hydrogen is present. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Exceptions:

1. Where rooms or spaces that contain hydrogen generating or refueling systems are ventilated in accordance with Section 1307.4.1.

2. Where rooms or areas that contain hydrogen generating or refueling systems are ventilated in accordance with Section 502.15 of the International Mechanical Code and one of the following:

   1. The ventilation system shall be designed to maintain the maximum concentration of flammable gas present below 25 percent of the lower flammability limit of the substance for the expected room temperature; or

   2. Continuous ventilation shall be provided at a rate not less than 1 cubic foot per minute per square foot \([0.0051m^3/(s \times m^2)]\) of floor area of the room.

   3. Where rooms or areas that contain hydrogen generating or refueling systems are ventilated in accordance with Section M1307.4.2

1307.4.1 Natural Ventilation. Rooms or spaces located underneath or adjacent to habitable space and intended for hydrogen generating or refueling operations shall be provided with mechanical ventilation as required by the exception to Section M1307.4 or shall communicate with the outdoors in accordance with Sections M1307.4.1.1 through M1307.4.1.2. The minimum dimension of air openings shall be not less than 3 in. (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect.

1307.4.1.1 Two openings. Two permanent openings, one commencing within 12 inches (305 mm) of the ceiling of the garage, and one commencing within 12 inches (305 mm) of the floor of the garage, shall be provided. The openings shall communicate directly, or by ducts, with the outdoors. Each opening shall be at least one-third the size of the opening and have a minimum free area of \(0.063 m^2\) per 1,000 cubic feet of garage volume.

1307.4.1.2 Louvers and grilles. In calculating free area required by Section 1307.4.1.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be used in calculating the size of opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Louvers and grilles shall be fixed in the open position.

1307.4.2 Specially engineered installations. As an alternative to the provisions of Sections M1307.4.1, the necessary supply of air for ventilation and dilution of flammable gases shall be provided by an approved engineered system.

   (Renumber remaining sections)

CHAPTER 202
DEFINITIONS

Proponent’s Reason: Introduction. Hydrogen energy safety is based on three primary elements: regulatory requirements, capability of safety technology and the systemic application of equipment and procedures to minimize risks. Groups involved in the industrial scale production of hydrogen (producers) currently implement many successful proprietary methodologies for safely generating and handling large amounts of hydrogen. Hydrogen users (e.g., NASA) depend on cryo-hydrogen as a fuel and have effectively proven the safety of large scale ground and vehicle systems which support the Space Shuttle Program.

The efforts of the International Code Council Ad Hoc Committee for Hydrogen Gas (AHC) intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and hydrogen gas motor-vehicle fuel dispensing and generation stations. The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes. This, and other, related proposals is a summation of their work.

IRC Section 1307.4. Ventilation, whether natural or mechanical, cannot remove all risk from combustible gas leaking into a garage. Based on ongoing research into the dispersion characteristics of gaseous hydrogen, and conducted at the University of Miami, Coral Gables, ½ square foot per 1,000 cubic feet of garage volume greatly reduces risk, assuming upper and lower openings of approximately equal areas are used. In addition, relying entirely on natural (i.e., passive) ventilation, the ventilation exchange rate increases with increasing hydrogen concentration due to the buoyancy of hydrogen. This is in contrast to mechanical (i.e., active) ventilation, which remains at a constant rate despite any change in hydrogen concentration.

The following is a comparison of a ventilated garage with an unventilated garage, for three leakage rates. The leakage rates were 1.0, 4.0 and 13.0 SCFM. It should be stated clearly that the findings of the University of Miami are based on leakage at the refueling interface and not the vehicle fuel tank. The AHC feels this is a reasonable assumption given the very real potential for the future installation of remote home gaseous hydrogen refueling appliances.

The comparisons of hydrogen accumulation in the garage show the reduction in risk with garage ventilation. The comparisons were made after 20 minutes of leakage. If a garage has openings, the hydrogen accumulation has reached relative equilibrium after 20 minutes and does not continue to increase appreciably with time. If a garage is not ventilated the hydrogen will continue to accumulate with time and eventually produce a hazardous environment.

The two garages, in Figures C1 through C6, are identical with the exception that the first garage did not have an upper opening. Both garages have lower openings, which spanned the bottom of the garage door. The openings were sized at ½ ft²/1000 ft³ of garage volume. The leak was assumed to occur at the vehicle-filling interface, as this type of leakage is difficult to detect. The filling interface was located on the rear passenger side fender. The garage was 9 feet 2.5 inches high by 12 feet 2 inches wide by 21 feet long.

Figures C1 and C2 show the results of hydrogen leaking at 1 SCFM for 20 minutes. The garage without an upper opening is shown in figure C1. The red lines (dark lines) are a surface of constant 4.1% concentration. 4.1% concentration is the lean limit of combustion for hydrogen. It can be seen that a layer of burnable gases approximately 9 inches thick were trapped against the garage ceiling. The blue lines (grey lines) represent a surface of constant 0.82% hydrogen (20% of the lean limit of combustion). They exist down to a level approximately 28 inches below the ceiling. The result of using both lower and upper openings can be seen in figure C2. No appreciable burnable (4.1% hydrogen concentration) gases exist in the garage and the gases, which are richer than 20% of the lean limit of combustion, are only 21 inches thick.

As seen in figure C3 and C4, a 4.0 SCFM leak of hydrogen produces a burnable mixture in both garages. The layer of burnable gases in the lower garage (figure C4 with upper and lower openings) was about 11.0 inches thick, as opposed to 34 inches thick, and contained less than 1/10 the energy of the upper garage (figure C3). The severity of an accident would be substantially reduced by the lower energy content of the burnable gases in figure C4. The buoyancy of hydrogen created a 123 SCFM ventilation rate in the garage in figure C6.

As seen in figure C5, a 20-minute 13.0 SCFM leak of hydrogen almost completely filled the garage with a burnable mixture if no upper opening was provided. The ventilated garage (figure C6) contained a burnable layer approximately 22 inches thick. This was noticeably less than in the unventilated garage with a 4 SCFM leak (figure C4) and contained less than half the energy. The buoyancy of hydrogen created a 123 SCFM ventilation rate in the garage in figure C6.

The SAE Fuel Cell Vehicle (FCV) Standards Committee has been monitoring and contributing to the work of the AHC and is aware of the AHC’s decision to require additional natural or mechanical ventilation ONLY in rooms or spaces intended for hydrogen generating or refueling operations. To be explicitly clear it is NOT the intent of the AHC to require additional natural or mechanical ventilation in areas solely dedicated to the parking/storage of hydrogen-fueled vehicles (i.e., where no hydrogen generating or refueling operation is present).

Therefore, to inform the U.S. Building Regulatory Community of measures the SAE Fuel Cell Vehicle (FCV) Standards Committee plans to take to ensure safety, the Safety Working Group of the SAE FCV Standards Committee is currently preparing guidelines for “recommended practices”. The following recommendations have been incorporated into drafts of these standards to address hydrogen safety for the situation cited above:

1. Fuel systems will be designed and built to appropriate standards and leak tested to demonstrate integrity.

2. Performance-based requirements related to parking an FCV in a single-bay residential garage have been established. The standard requires validation testing in a garage with very low natural ventilation (of only 0.2 air exchanges per hour) to ensure that the vehicle is normally capable of being safely stored in a residential garage.

3. The vehicle manufacturer (VM) is required to perform a Failure Mode and Effects Analysis (FMEA) for the vehicle. If a single failure could lead to hazardous event, the vehicle manufacturer is required to either modify the system to preclude the failure mode, add failsafe or redundant design measures to prevent the failure, or improve the integrity of components and systems such that risks of these failures are acceptably minimal.

4. If the vehicle manufacturer (VM) is unable to meet any of the above requirements, then the VM shall caution the owner/operator of the vehicle of any operating or parking restrictions.

SAE trusts that the U.S. Building Regulatory Community will find these measures suitable for product introduction. As operating experience is accrued with these new types of vehicles, both SAE and the ICC may need to reassess the situation and provide additional measures for FCV safety as necessary.

Thus, in crafting the proposed language specific to ventilation, the AHC has reviewed the findings of the University of Miami and takes the position that existing provisions for mechanical ventilation of residential garages are not enforced. In concert with these findings and our confidence in the SAE Safety Working Group’s investigations into failure mode analyses for hydrogen-fueled vehicle design, the AHC has recommended both natural and mechanical ventilation alternatives for private garages located underneath living space and intended for hydrogen generating or refueling operations. For the natural ventilation alternative, the proposed ½ ft² of net free area per 1,000 cubic feet of garage floor area represents a minimum. This level of ventilation provides more than a 100 SCFM mechanical system would provide when the hydrogen leak is greater than 8 SCFM. Protection against higher leakage rates than those represented in the University of Miami.
study could be obtained by larger opening areas. In fact, the opening size and location criteria are not unlike those required to meet combustion air requirements.

**In Summary.** The AHC has developed these changes through the consultation of a diverse group of technical and advisory parties from various parties in the hydrogen community, inclusive of industry, professional associations, testing laboratories, agencies of government, academic and research institutions and believes it important to provide a template for thorough coverage in the International Codes of equipment, appliances and vehicles that will utilize hydrogen as a fuel such that regulators have a sound technical basis on which to verify installation and to uphold the standard of health and safety for the citizens of their jurisdictions.

Industry is ready to commercialize hydrogen energy systems. The AHC urges your APPROVAL of this proposal “as submitted”.
Figure C 1 - Unvented garage, 1 SCFM hydrogen leak for 20

Figure C 2 - Vented garage, 1 SCFM hydrogen leak for 20
Figure C 3 - Unvented garage, 4 SCFM hydrogen leak for 20

Figure C 4 - Vented garage, 4 SCFM hydrogen leak for 20
Figure C 5 - Unvented garage, 13 SCFM hydrogen leak for 20

Figure C 6 - Vented garage, 13 SCFM hydrogen leak for 20
ITEM 1 (IMC)  
Committee Action: Approved as Modified

Modify proposal as follows:

IMC 304.3 Location Elevation of ignition source. Equipment and appliances having an ignition source and located in hazardous locations and public garages, private garages, repair garages, automotive service stations, and parking garages where flammable liquids or flammable gases heavier than air are present shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor surface on which the equipment or appliance rests. Such equipment and appliances shall not be installed in Group H occupancies or control areas where open-use, handling or dispensing of combustible, flammable or explosive materials occurs. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Add new text as follows:

304.4 Hydrogen Generating and Refueling Operations. In rooms or spaces that contain hydrogen generating or refueling systems, equipment and appliances having an ignition source shall be located such that the ignition source is not less than 24 inches (457 mm) below the ceiling in hazardous locations and public garages, private garages, repair garages, automotive service stations and parking garages where gaseous hydrogen is present. Such equipment and appliances shall not be installed in Group H occupancies or control areas where open-use, handling or dispensing of combustible, flammable or explosive materials occurs. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Exceptions:
1. Where rooms or spaces that contain hydrogen generating or refueling systems are ventilated in accordance with Section 304.4.1

2. Where rooms or spaces that contain hydrogen generating or refueling systems are ventilated in accordance with Section 302.15 of the International Mechanical Code and the following:

2.1. The ventilation system shall be designed to maintain the maximum concentration of flammable contaminants below 25 percent of the contaminant’s lower flammability limit; or

2.2. Continuous ventilation shall be provided at a rate not less than 1 cubic foot per minute per square foot \([0.0051m^3/(s \times m^2)]\) of floor area of the room.

3. Where rooms or spaces that contain hydrogen generating or refueling systems are ventilated in accordance with Section 304.4.2

(No modification to remainder of code change)

Committee Reason: The IMC needs to be proactive and include this new technology in the code before it begins to be installed. As the technology improves and the price drops, these units will become widely accepted and the code official needs the guidance to ensure they are properly installed. The modification deletes changes to Section 304.3 to return it to its original language and deletes the reference to the IMC in Section 304.4, Exception 2.

Assembly Action: No Motion

ITEM 2 (IRC)  
Committee Action: Disapproved

Committee Reason: The committee did not want to add this technology to the IRC until further study and data are available.

Assembly Action: Approved as Modified

Modify proposal as follows:

2. IRC M1307.3 Location Elevation of ignition source. Appliances having an ignition source shall be elevated such that the ignition source is not less than 18 inches (457 mm) above the floor in garages where flammable liquids or flammable gases heavier than air are present. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the garage.

(No modification to remainder of code change)

Individual Consideration Agenda

This item is on the agenda for individual consideration because the public hearing actions resulted in a technical inconsistency between the International Residential Code and the associated ICC International Code, an assembly action was successful and a public comment was submitted.

Public Comment:

ICC Ad Hoc Committee for Hydrogen Gas, requests Approved as Modified by this comment.

Modify proposal as follows:

ITEM 1 (IMC)  
No change to current Section 304.3 (current text of Section 304.3 remains unchanged)

304.4 Hydrogen Generating and Refueling Operations. In rooms or areas that contain hydrogen generating or refueling systems, equipment and appliances having an ignition source shall be located such that the source of ignition is not less than 24 inches (457 mm) below the ceiling in hazardous locations and public garages, private garages, repair garages, automotive service stations and parking garages where gaseous hydrogen is present which contain hydrogen generating appliances or refueling systems. Such spaces shall be used for the storage of not more than three hydrogen-fueled passenger motor vehicles and have a floor area not exceeding 850 square feet. The maximum rated output capacity of hydrogen generating appliances shall not exceed 4 SCFM of hydrogen for each 250 square feet of floor area in such spaces. Such equipment and appliances shall not be installed in Group H occupancies unless the occupancy is specifically designed for hydrogen use, or in control areas where open-use, handling or dispensing of combustible, flammable or explosive materials occurs. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Exceptions:

4. Where rooms or areas that contain hydrogen generating or refueling systems are ventilated in accordance with Section
2002 ICC FINAL ACTION AGENDA

304.4.1 Natural Ventilation. Rooms or spaces located underneath or adjacent to habitable space and indoor locations intended for hydrogen generating or refueling operations shall be provided with mechanical ventilation as required by exception to Section 502.15 or shall communicate with the outdoors in accordance with Sections 304.4.1.1 through 304.4.1.2. The minimum dimension of air openings shall be not less than 3 in. (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect. In such locations, equipment and appliances having an ignition source shall be located such that the source of ignition is not less than 12 inches (228 mm) below the ceiling.

304.4.1.1 Two openings. Two permanent openings, one commencing located entirely within 12 inches (305 mm) of the ceiling of the garage, and one commencing located entirely within 12 inches (305 mm) of the floor of the garage, shall be provided in the same exterior wall. The openings shall communicate directly, or by ducts, with the outdoors. Each opening shall directly communicate with the outdoors horizontally, and have a minimum free area of ½ square foot per 1,000 cubic feet of garage volume.

304.4.1.2 Louvers and grilles. In calculating free area required by Section 304.4.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Louvers and grilles shall be fixed in the open position.

304.4.2 Mechanical ventilation. Indoor locations intended for hydrogen generating or refueling operations shall be ventilated in accordance with Section 502.15.

304.4.3 Specially engineered installations. As an alternative to the provisions of Sections 304.4.1 and 304.4.2 the necessary supply of air for ventilation and dilution of flammable gases shall be provided by an approved engineered system.

SECTION 202
GENERAL DEFINITIONS

HYDROGEN GENERATING APPLIANCE. A self-contained package or factory-matched packages of integrated systems for generating gaseous hydrogen. Hydrogen generating appliances utilize electrolysis, reformation, chemical, or other processes to generate hydrogen.

ITEM 2 (IRC)
No change to current Section 1307.3 (current text of Section 1307.3 remains unchanged)

1304.1 Natural Ventilation. Rooms or spaces located underneath or adjacent to habitable space and indoor locations intended for hydrogen generating or refueling operations shall be provided with mechanical ventilation as required by exception to Section 1307.4 or shall communicate with the outdoors in accordance with Sections 1307.4.1 through 1307.4.1.2. The minimum dimension of air openings shall be not less than 3 in. (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect. In such locations, equipment and appliances having an ignition source shall be located such that the source of ignition is not less than 12 inches (228 mm) below the ceiling.

1307.4.1.1 Two openings. Two permanent openings, one commencing located entirely within 12 inches (305 mm) of the ceiling of the garage, and one commencing located entirely within 12 inches (305 mm) of the floor of the garage, shall be provided in the same exterior wall. The openings shall communicate directly, or by ducts, with the outdoors. Each opening shall directly communicate with the outdoors horizontally, and have a minimum free area of ½ square foot per 1,000 cubic feet of garage volume.

1307.4.1.2 Louvers and grilles. In calculating free area required by Section 1307.4.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Louvers and grilles shall be fixed in the open position.

1307.4.2 Mechanical ventilation. Indoor locations intended for hydrogen generating or refueling operations shall be ventilated in accordance with Sections 1307.4.1 through 1307.4.1.2. The minimum dimension of air openings shall be not less than 3 in. (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect. In such locations, equipment and appliances having an ignition source shall be located such that the source of ignition is not less than 12 inches (228 mm) below the ceiling.

Exceptions:

1. Where rooms or areas that contain hydrogen generating or refueling systems are ventilated in accordance with Section 1307.4.

2. Where rooms or areas that contain hydrogen generating or refueling systems are ventilated in accordance with Section 502.15 of the International Mechanical Code and the following:

1307.4.1.1 Natural Ventilation. Rooms or spaces located underneath or adjacent to habitable space and indoor locations intended for hydrogen generating or refueling operations shall be provided with mechanical ventilation as required by exception to Section 1307.4 or shall communicate with the outdoors in accordance with Sections 1307.4.1.1 through 1307.4.1.2. The minimum dimension of air openings shall be not less than 3 in. (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect. In such locations, equipment and appliances having an ignition source shall be located such that the source of ignition is not less than 12 inches (228 mm) below the ceiling.

1307.4.1.1.1 Two openings. Two permanent openings, one commencing located entirely within 12 inches (305 mm) of the ceiling of the garage, and one commencing located entirely within 12 inches (305 mm) of the floor of the garage, shall be provided in the same exterior wall. The openings shall communicate directly, or by ducts, with the outdoors. Each opening shall directly communicate with the outdoors horizontally, and have a minimum free area of ½ square foot per 1,000 cubic feet of garage volume.

1307.4.1.1.2 Louvers and grilles. In calculating free area required by Section 1307.4.1.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Louvers and grilles shall be fixed in the open position.

1307.4.2 Mechanical ventilation. Indoor locations intended for hydrogen generating or refueling operations shall be ventilated in accordance with Sections 1307.4.1 through 1307.4.1.2. The minimum dimension of air openings shall be not less than 3 in. (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect. In such locations, equipment and appliances having an ignition source shall be located such that the source of ignition is not less than 12 inches (228 mm) below the ceiling.

1307.4.2.1 Two openings. Two permanent openings, one commencing located entirely within 12 inches (305 mm) of the ceiling of the garage, and one commencing located entirely within 12 inches (305 mm) of the floor of the garage, shall be provided in the same exterior wall. The openings shall communicate directly, or by ducts, with the outdoors. Each opening shall directly communicate with the outdoors horizontally, and have a minimum free area of ½ square foot per 1,000 cubic feet of garage volume.

1307.4.2.1.1 Louvers and grilles. In calculating free area required by Section 1307.4.2.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Louvers and grilles shall be fixed in the open position.

1307.4.2.2 Mechanical ventilation. Indoor locations intended for hydrogen generating or refueling operations shall be ventilated in accordance with Sections 1307.4.2.1 through 1307.4.2.2. The minimum dimension of air openings shall be not less than 3 in. (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect. In such locations, equipment and appliances having an ignition source shall be located such that the source of ignition is not less than 12 inches (228 mm) below the ceiling.
accordance with Section 502.15 of the *International Mechanical Code*.

**1307.4.2 1307.4.3 Specially engineered installations.** As an alternative to the provisions of Sections 1307.4.1 and 1307.4.2 the necessary supply of air for ventilation and dilution of flammable gases shall be provided by an approved engineered system.

**CHAPTER 202 DEFINITIONS**

**HYDROGEN GENERATING APPLIANCE.** A self-contained package or factory-matched packages of integrated systems for generating gaseous hydrogen. Hydrogen generating appliances utilize electrolysis, reformation, chemical, or other processes to generate hydrogen.

**Commenter’s Reason:** The AHC has addressed and resolved the technical issues identified by the Code Development Committee directly as modified by this and other coordinated public comments to all hydrogen-related proposals (F176, M7, FG2, FG15, FG41 & FG48). The supporting Reason to FG2-02 provides a brief explanation of each solution.

The ICC AHC for Hydrogen Gas requests your Approval as Modified by this Public Comment (AMPC).

**Analysis:** The following combinations of actions would achieve technical consistency between the IPC and the IRC:

- Item 1 AS Item 2 AS
- Item 1 AM Item 2 AMAA
- Item 1 AMPC Item 2 AMPC
- Item 1 D Item 2 D

**M8-02 304.3 (IRC R1307.3)**

**Proposed Change as Submitted:**

**Proponent:** Robert D. Lee, Town of Cave Creek, representing the Arizona Building Officials

**THIS PROPOSAL IS ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**

**Revise as follows:**

1. **IMC 304.3 Elevation of ignition source.** Equipment and appliances having an ignition source and located in hazardous locations and public garages, private garages, repair garages, automotive service stations and parking garages shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor surface on which the equipment or appliance rests. Such equipment and appliances shall not be installed in Use Group H occupancies or control areas where open use, handling or dispensing of combustible, flammable or explosive materials occurs. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

**Exception:** Clothes dryers installed in private garages.

2. **IRC M1307.3 Elevation of ignition source.** Appliances having an ignition source shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor in garages. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate with a private garage through openings shall be considered to be part of the garage.

**Exception:** Clothes dryers installed in private garages.

**Proponent’s Reason:** In the definition of clothes dryers, it specifically calls a clothes dryer an appliance. ICBO has had a longstanding opinion that a clothes dryer was a portable appliance and therefore not subject to this requirement. Other types of portable appliances such as clothes washers, freezers and refrigerators are not regulated and clothes dryers present no greater hazard.

**Analysis:** If a clothes dryer is a portable appliance, it is not covered by this code since this code specifically excludes portable appliances. Since clothes dryers are addressed in Chapter 9, it is apparent that the IMC does not consider clothes dryers to be portable.

**ITEM 1 (IMC)**

**Committee Action:** Disapproved

**Committee Reason:** Clothes dryers are regulated by the IMC and must meet all requirements, including elevation of potential ignition sources.

**Assembly Action:** No Motion

**ITEM 2 (IRC)**

**Committee Action:** Disapproved

**Committee Reason:** Clothes dryers can produce sparks which can ignite fumes in the garage.

**Assembly Action:** Approved as Submitted—Motion Failed

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

David Fizzell, City of Prescott, AZ, requests Approved as Submitted for Items 1 and 2.
Commenter's Reason: A review of the statistics from NAHB, NFPA, and FEMA shows that there have been over 26 million houses constructed in the United States between 1978 and 2001. Approximately one third, 8.5 million, of these have been built in the western portion of the country under the ICBO codes. ICBO has had a long-standing policy that considered dryers to be portable equipment and as such they were not regulated by the code. Based upon this policy several jurisdictions did not require dryers in garages to be elevated above the floor.

Using the 8.5 million units as a base I believe it is fair to assume that at least one third, 2.8 million, of these have dryers sitting on the floor of the garage. This number does not include houses built prior to 1978 or those built in the rest of the country.

The statistics for dryer fires for the years 1980 through 1997 show that there have been an average of 13,600 fires. All reporting agencies agree that the leading cause of these fires was poor maintenance, particularly lint in the dryer or in the vent, and not the location of the dryer on the floor of the garage. With well over the conservative number of 3 million dryers installed in garages, and if there was truly a hazard associated with gasoline fumes, or other fumes, one would expect to see a record of fires caused by these fumes.

Since the records do not show that there is a trend of dryer fires associated with flammable vapors in garages the code should not penalize the home owners with a requirement that is not supported by the statistics and limits the design of their home.

Analysis: The following combinations of actions would achieve technical consistency between the IMC and the IRC:

1. **Item 1** or **Item 1AS**
2. **Item 2 D**
3. **Item 2 D**

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**M13-02**

**306.5**

**Proposed Change as Submitted:**

**Proponent:** Rene Beliveau; City of Golden Building Division and Guy McMann, Jefferson County Building Department, representing Colorado Association of Plumbing and Mechanical Officials

**Revise as follows:**

306.5 Equipment and appliances on roofs or elevated structures. Where equipment and appliances requiring access are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances’ level service space. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope).

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be a minimum of 18 inches (457 mm) between rails.
5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 250-pound load.
6. Ladders over 30 feet in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot.
7. Ladders shall be protected against corrosion by approved means.

**Exception:** This section shall not apply to Group R-3 occupancies.

**Proponent’s Reason:** This additional language augments requirements that had been included in prior mechanical codes. This proposal also draws from OSHA requirements for fixed ladders and load requirements as contained in the IBC provisions for fire escapes. Minimum uniform design standards are required and necessary for these ladders so as to insure the safety and protection of service and building maintenance personnel, inspectors, fire fighters, and others, which may be using these ladders during normal use, emergency situations, or inclement weather conditions.

It serves no purpose to require an “approved means or access” if we cannot have some measure of surety that ladders installed to meet this requirement are safe and suitable for their intended purpose. Simply requiring an “approved means of access” without providing minimum design standards is too subjective for ladder access and can lead to a wide range of designs resulting in arbitrary and capricious enforcement.

This code change proposal is being submitted in conjunction with proposed code changes to the IBC Section 1208.3.

**Committee Action:** Approved as Modified

**Modify proposal as follows:**

306.5 Equipment and appliances on roofs or elevated structures. Where equipment and appliances requiring access are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances’ level service space. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope).

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be a minimum of 18 inches (457 mm) between rails.
5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 250-300-pound load.

6. Ladders over 30 feet in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot.

7. Ladders shall be protected against corrosion by approved means.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 occupancies.

Committee Reason: Based on proponent’s published reason. The modification adds guidance for constructing catwalks.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Henry M. Webster, North Carolina Department of Insurance, requests Approved as Modified by this comment.

Modify proposal as follows:

306.5 Equipment and appliances on roofs or elevated structures. Where equipment and appliances requiring access are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances’ level service space. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope).

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be a minimum of 18 inches (457 mm) between rails.
5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 300-pound load.
6. Ladders over 30 feet in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot.
7. Ladders shall be protected against corrosion by approved means.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Permanent ladders and catwalks shall be affixed to the structure as required by the International Building Code. Stairways providing the required access shall comply with the International Building Code.

Exception: This section shall not apply to Group R-3 occupancies.

Commenter’s Reason: Section 306.5 and the proposed modification for the catwalks do not include details for attaching the permanent ladders and catwalks to the structure. The proposed modification will add reference to the IBC for details of attaching the permanent ladders and catwalks to the structure.

M18-02

403.2.1, T.403.3

Proposed Change as Submitted:


Revise as follows:

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.

2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces, except that recirculation to other spaces shall be permitted where the resulting supply air contains not more than 10 percent air recirculated from these spaces.

3. Where mechanical exhaust is required by note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.

4. Where mechanical exhaust is required by note h in Table 403.3, mechanical exhaust is required and recirculation is prohibited except that recirculation shall be permitted where the resulting supply air contains not more than 10 percent air recirculated from these spaces.

<table>
<thead>
<tr>
<th>TABLE 403.3 (Supp)</th>
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<tr>
<td>REQUIRED VENTILATION AIR</td>
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**Occupancy Classification**

<table>
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<th>Correction facilities</th>
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<td>Cells (with plumbing fixtures)</td>
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**Education**
Footnote b to Table 402.3: This is for correlation with the text proposed for 403.2.1(2) and (4). The footnote follows the consistent and useful format for tables in which a footnote captures the provision stated elsewhere in text and references the applicable section for the convenience of the code user. The limited allowance of recirculation applies only to those spaces that are indicated with reference to footnote h. (This footnote may be more logically positioned as a new footnote c to follow current footnote b. It was proposed as footnote h only to simplify presentation of the proposed change and to avoid having to clutter the proposal with showing the editorial redesignation of existing footnote letters.)

This proposal will not increase the cost of construction.

Committee Action: Disapproved

Committee Reason: The proposal has formatting problems as follows: Item 3 of Section 403.2.1 directly references a table footnote “b”; Item 2 of that section is an exception to an exception. The ASHRAE 62 addendum referenced in the proponent’s reason is not complete.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Ken Schoonover, P.E., President KMS Associates, Inc., requests Approved as Modified by this comment.

Modify proposal as follows:

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces, except that recirculation to other spaces shall be permitted where the resulting supply air contains not more than 10 percent air recirculated from these spaces, where 10 percent or more of the resulting supply airstream consists of air recirculated from these areas.

(No change to remainder of code change)

Commenter’s Reason: The committee’s reason for disapproval included three concerns.
1) The committee apparently considers directly referencing a table footnote in item 3 to be a formatting problem. Footnote b and proposed footnote h contain clear and definitive provisions on recirculation limitations and prohibitions. The footnotes are used in Table 403.3 specifically to establish which occupancies must meet those conditions. Directly referencing the table footnotes will make

2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces, except that recirculation to other spaces shall be permitted where the resulting supply air contains not more than 10 percent air recirculated from these spaces, where 10 percent or more of the resulting supply airstream consists of air recirculated from these areas.

(No change to remainder of code change)

Commenter’s Reason: The committee’s reason for disapproval included three concerns.
1) The committee apparently considers directly referencing a table footnote in item 3 to be a formatting problem. Footnote b and proposed footnote h contain clear and definitive provisions on recirculation limitations and prohibitions. The footnotes are used in Table 403.3 specifically to establish which occupancies must meet those conditions. Directly referencing the table footnotes will make
the intent, interpretation and application of the proposed text explicit and very clear. Referencing a table footnote in this respect is just as valid and appropriate as the hundreds of cross-references throughout the code to other provisions by section number.

2) The proposed wording for item 2 was effectively an exception within an exception. The committee is correct that such a format is not appropriate. The proposed modification rectifies the problem.

3) The ASHRAE Addendum that was the source for the proposed change may or may be completed by the time of the Final Action Hearings, but acceptability of the proposed change is not dependent on completion of the last steps of ASHRAE’s process. The proposed text is not directly referencing the Addendum. There is general agreement on the principle of allowing a limited amount of recirculation of non-hazardous air and, in practice, it has long been occurring in HVAC systems and in buildings in general, just not by specific design. Whether or not the Addendum is officially completed by the hearing, there are no anticipated or pending objections or issues within the ASHRAE process that bear on this principle. Consensus for all practical purposes has been established.

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**M35-02**

**506.3.5**

**Proposed Change as Submitted:**

**Proponent:** Douglas J. Horton, D.J. Horton and Associates, Inc., representing Commercial Kitchen Ventilation Technical Interest Group

**Revise as follows:**

506.3.5 Air velocity. Grease duct systems serving a Type I hood shall be designed and installed to provide an air velocity within the duct system of not less than 500 feet per minute (7.6 m/s).

Exception: The velocity limitations shall not apply within duct transitions utilized to connect ducts to differently sized or shaped openings in hoods and fans, provided that such transitions do not exceed 3 feet (914 mm) in length and are designed to prevent the trapping of grease.

**Proponent’s Reason:** Research conducted by ASHRAE (1151RP) indicates there is no basis for a minimum duct velocity of 1500 fpm, and that a lower minimum velocity specification is feasible. Since a majority of cooking effluents are vapor and very small particulates, duct velocity does not significantly affect grease deposition. The revision to 500 fpm is consistent with the 2001 revision of NFPA Standard 96.

**Committee Action:** Disapproved

**Committee Reason:** No technical justification was presented to support the change from 1500 to 500 fpm.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

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**Public Comment:**


**Commenter’s Reason:** Research conducted by ASHRAE (1033-RP) indicates there is no justification for a minimum duct velocity requirement of 1500 fpm, and that a lower requirement for minimum duct velocity is feasible. Research experiments indicate that a reduction in duct velocity can actually decrease grease deposition since turbulence in the duct, which promotes grease deposition, is reduced as duct velocity is decreased. Reduction of minimum duct velocity requirements will also ease requirements for reducing exhaust volumes in existing systems, as permitted by other code sections. This modification does not promote designing to lower duct velocities; rather, it provides design flexibility based on credible research results. This modification is also consistent with the 2001 revision of NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

Errata to 2001 edition of NFPA Standard 96, Section 8.2.1.1:

NFPA 96


2001 Edition

Reference: 8.2.1.1

Errata No.: 96-01-01


1. In section 8.2.1.1 revise to read as follows:

'8.2.1.1 The air velocity through any duct shall be not less than 152.4 m/min (500 ft/min).

**Issue Date:** January 10, 2002


Experiments have been conducted in a 10 in. (25.4 cm) square horizontal duct to determine the effect of mean exhaust velocity on the rate of grease accumulation in straight commercial kitchen ducts. Four mean velocities were used - 500, 1000, 1500, and 2000 fpm (2.54, 5.08, 7.62, and 10.16 m/s) - with deposition rates of three types of effluent (particles, vapor, and actual cooking effluent) measured at each. The mass median aerodynamic diameter of particles consisting of oleic acid ranged from 0.49 Fm to 4.3 Fm. The vapor transfer tests were conducted using octanoic acid. Cooking beef patties on an electric broiler generated actual cooking effluent. Results show that the rate of grease accumulation decreases with reduced velocity for all duct scenarios when the entering effluent temperature and concentration are fixed. When the effluent source remains constant, a reduction in duct velocity will decrease the rate of grease insulation for well-insulated ducts, but the change in non-insulated ducts depends on the specific conditions.

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**M37-02**

**506.3.7**

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2002 ICC FINAL ACTION AGENDA
Proposed Change as Submitted:


Revise as follows:

506.3.7 Clearances. Grease duct systems serving a Type I hood shall have a clearance to combustible construction of not less than 18 inches (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm).

(No change to exception)

Proponent's Reason: The addition of the 3-inch clearance is based on NFPA 96 Limited Combustible reference. It was common practice in years past to install these systems with these clearances for gypsum. This new text also requires noncombustible supporting structures. A further reduction of clearances for hoods has already been approved in current Section 507.9.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent's published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council, requests Disapproved.

Commenter's Reason: The basis on which this proposal was accepted needs to be analyzed more closely. In 1994, the committee responsible for NFPA 96 conducted extensive investigations into the clearance requirements for enclosures for grease ducts. This data was used to revise the 1998 and 2001 versions of NFPA 96, which reflect these studies. These versions both maintain the clearance to limited combustibles of 6 in. for enclosures unless they are fire tested to evaluate whether reduced clearance can be allowed.

While NFPA 96 does allow a reduction in clearance for air ducts, it specifically does not allow them for Kitchen Grease ducts. Section 7.7.2 of NFPA 96-2001 contains the following requirements:

Enclosures Fire Resistance Rating and Enclosure Clearance.
7.7.2.2.2 Clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible shall be not less than 152.4 mm (6in.).

7.7.2.2.3 Provision for reducing clearances as described in Section 4.2 shall not be applicable to enclosures.

Similarly, Section 4-7.3.3 of NFPA 96-98 Stated;

Clearance from the duct or the exhaust fan to the interior surface of enclosures of combustible construction shall be not less that 18 in. (457.2 mm) and clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible construction shall be not less than 6 in. (152.4 mm). Provisions for reducing clearances as described in 1-3.2 are not applicable to enclosures.

Clearly, both NFPA 96 1998 and 2001 versions do not allow for reduction of clearance to 3 in. as stated by the proponent.

Section 506.3.11 of the IMC already provides the clearance requirements for duct enclosures and limits it to a minimum of 6 in.

First, NFPA does allow reduction in clearance for air ducts but does not allow them for Kitchen Grease ducts. NFPA 96 states the following; NFPA 96 -2001 Section 7.7.2 Enclosures Fire Resistance Rating and Enclosure Clearance. 7.7.2.2.2 Clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible shall be not less than 152.4 mm (6in.). 7.7.2.2.3 Provision for reducing clearances as described in Section 4.2 shall not be applicable to enclosures.

NFPA 96 – 98 Section 4-7.3.3 “Clearance from the duct or the exhaust fan to the interior surface of enclosures of combustible construction shall be not less than 18 in. (457.2 mm) and clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible construction shall be not less than 6 in. (152.4 mm). Provisions for reducing clearances as described in 1-3.2 are not applicable to enclosures. Thus both NFPA 96 1998 and 2001 versions do not allow for reduction of clearance to 3 in. as stated by the proponent.

NFPA 96 committee back in 1994 conducted extensive investigations into the clearance requirements for enclosures for grease ducts and both the 1998 and 2001 versions of NFPA 96 reflect these studies and maintain the clearance to limited combustibles of 6 in. for enclosures unless they are fire tested to show reduced clearance can be allowed. Section 506.3.11 of the IMC already provides the clearance requirements for duct enclosures and limits it to a minimum of 6 in.

The flexible wrap systems have provided this type of information and there are listed systems available that provide 0 in. clearances or combustibles. I urge the membership to reject the action of the committee and disapprove M37-02 as it would conflict with NFPA 96 and would reduce fire safety of grease ducts.

Words could be added in the next code cycle to clarify that the reduction in clearance is not intended for grease duct enclosures and only for grease ducts not required to be enclosed the reduction to 3 inches meets the intent of NFPA 96.

Public Comment 2:

Richard Licht, RRL Consulting Solutions, Inc., requests Disapproved.

Commenter's Reason: The proponent stated that this was already allowed in NFPA 96 and that there are no systems or enclosures available for clearance less than 6 inches as required by the codes today.

First, NFPA does allow reduction in clearance for air ducts but does not allow them for Kitchen Grease ducts. NFPA 96 states the following; NFPA 96 -2001 Section 7.7.2 Enclosures Fire Resistance Rating and Enclosure Clearance. 7.7.2.2.2 Clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible shall be not less than 152.4 mm (6in.). 7.7.2.2.3 Provision for reducing clearances as described in Section 4.2 shall not be applicable to enclosures.

NFPA 96 – 98 Section 4-7.3.3 “Clearance from the duct or the exhaust fan to the interior surface of enclosures of combustible construction shall be not less than 18 in. (457.2 mm) and clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible construction shall be not less than 6 in. (152.4 mm). Provisions for reducing clearances as described in 1-3.2 are not applicable to enclosures. Thus both NFPA 96 1998 and 2001 versions do not allow for reduction of clearance to 3 in. as stated by the proponent.

NFPA 96 committee back in 1994 conducted extensive investigations into the clearance requirements for enclosures for grease ducts and both the 1998 and 2001 versions of NFPA 96 reflect these studies and maintain the clearance to limited combustibles of 6 in. for enclosures unless they are fire tested to show reduced clearance can be allowed. Section 506.3.11 of the IMC already provides the clearance requirements for duct enclosures and limits it to a minimum of 6 in.

The flexible wrap systems have provided this type of information and there are listed systems available that provide 0 in. clearances to combustibles. I urge the membership to reject the action of the committee and disapprove M37-02 as it would conflict with NFPA 96 and would reduce fire safety of grease ducts.

Words could be added in the next code cycle to clarify that the reduction in clearance is not intended for grease duct enclosures and only for grease ducts not required to be enclosed the reduction to 3 inches meets the intent of NFPA 96.
Proposed Change as Submitted:


Revise as follows:

506.3.11 (Supp) Duct enclosure. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall only penetrate exterior walls at locations where unprotected openings are permitted by the International Building Code. Ducts shall be enclosed in accordance with the International Building Code requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings. The enclosure shall be separated from the duct by a minimum of 6 inches (152 mm) and a maximum of 12 inches (305 mm) except as otherwise required by Section 506.3.7. The duct enclosure shall serve a single grease exhaust duct system.

Exceptions:
1. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration protection system tested in accordance with ASTM E 814 having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from the point at which the duct penetrates a ceiling wall or floor to the outlet terminal with a listed and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with nationally recognized standard for such enclosure materials. Exposed duct wrap systems shall be protected where subject to physical damage.
2. (No change)

Proponent’s Reason: These systems typically consist of foil covered material that can be easily damaged by the normal operations of most businesses. A hand truck or a pallet lift are common items for stocking restaurants. These devices, used in daily operation, could potentially rip these wrap materials away from the duct if they were to be pushed to close to the unprotected installations. A potentially dangerous situation would be left until a qualified installer was able to make the repair.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council, requests Disapproved.

Commenter’s Reason: In supporting the proposed change, the proponents suggested that these systems typically consist of foil covered insulating material, and can be easily damaged by normal operations such as a hand truck or a pallet lift. However, the same can be said for other forms of duct protection systems. Many board products can be damaged by inappropriate use of hand trucks, pallet lifts, and forklift trucks. The Building Code cannot address the prevention of damages to any active or passive fire protection system based on inappropriate use of machinery or equipment or poor maintenance. Further, the Fire Code does address these types of problems in all buildings, including the maintenance and repair. Localized damage to a duct wrap system poses no more hazard than does localized damage to a rigid duct enclosure system, or a poorly maintained sprinkler system. Any such problems need to be repaired and rectified, and the Fire Code provides the means to effect the necessary corrective actions.

Public Comment 2:

Richard Licht, RRL Consulting Solutions Inc., requests Approved as Modified by this comment.

Modify proposal as follows:

506.3.11 (Supp) Duct enclosure. (No change)

Exceptions:
1. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration protection system tested in accordance with ASTM E 814 having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from the point at which the duct penetrates a ceiling wall or floor to the outlet terminal with a listed and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with nationally recognized standard for such enclosure materials. Exposed duct wrap systems shall be protected where subject to physical damage.
2. (No change)

506.11.1 Where duct covering or enclosure materials are susceptible to physical damage, approved protective measures shall be taken.

Commenter’s Reason: Putting this under the exception will only require protection of materials that are classified and labeled as meeting this exception. All types of enclosures are susceptible to physical damage, not just the flexible wrap type systems. Gypsum shaft enclosures can be easily damaged by pallet trucks and other objects hitting or running into the gypsum shaft wall. Putting this in the general section (506.3.11) will provide the proper protection of all types of enclosures and can be done at the desecration of the authority having jurisdiction.
NFPA 96-2001 has a section (7.7.3) which is “Protection of Coverings and Enclosure Materials”, which discusses protection, repair, and qualifications for protection of enclosures material. This wording would better serve the interest of the public and provide equal treatment of all materials used for enclosures that comply with the code.

I urge the membership to support this proposed modification to the committee’s action and move this change to the proper location.

Public Comment 3:

Richard Licht, RRL Consulting Solutions Inc., requests Approved as Modified by this comment.

Modify proposal as follows:

506.3.11 (Supp) Duct enclosure. (No change)

Exceptions:

1. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration protection system tested in accordance with ASTM E 814 having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from the point at which the duct penetrates a ceiling wall or floor to the outlet terminal with a listed and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with nationally recognized standard for such enclosure materials.

2. (No change)

506.3.11.1 Protective measures. Measure shall be taken to prevent physical damage to any covering or enclosure material.

506.3.11.2 Repairs. Any damage to the covering or enclosure shall be repaired and the covering or enclosure shall be restored to meet its intended listing and fire-resistive rating and be approved.

Commenter’s Reason: Putting this under the exception will only require protection of materials that are classified and labeled meeting this exception. All types of enclosures are susceptible to physical damage not just the flexible wrap type systems. Gypsum shaft enclosures can be easily damaged by pallet trucks and other objects hitting or running into the gypsum shaft wall. Putting this in the general section (506.3.11) will provide the proper protection of all types of enclosures and can be done at the desecration of the authority having jurisdiction. NFPA 96-2001 has a section (7.7.3) which is “Protection of Coverings and Enclosure Materials”, which discusses protection, repair, and qualifications for protection of enclosures materials. This wording from NFPA 96-2001 would better serve the interest of the public and provide equal treatment of all materials used for enclosures that comply with the code.

I urge the membership to support this proposed modification to the committee's action and move this change to the proper location.

Public Comment 4:

Vickie J. Lovell, InterCode Incorporated, representing 3M company, requests Approved as Modified by this comment.

Modify proposal as follows:

506.3.11 (Supp) Duct enclosure. (No change)

Exceptions:

1. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration protection system tested in accordance with ASTM E 814 having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from the point at which the duct penetrates a ceiling wall or floor to the outlet terminal with a listed and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with nationally recognized standard for such enclosure materials.

2. (No change)

506.3.12 Protection of coverings and enclosure materials. Where a duct enclosure is subjected to physical damage during the normal operation of business, protection shall be provided to the enclosure to ensure that the duct remains structurally sound and capable of maintaining the fire protection functions. In the event of physical damage, the covering or enclosure shall be repaired and restored to meet its intended listing of clearance requirements and shall be approved. In the event of a fire within a kitchen exhaust system, the duct, the enclosure, or a covering directly applied to the duct shall be inspected by qualified personnel to determine whether the duct, the enclosure or any covering are structurally sound, capable of maintaining their fire protection functions and suitable for continued operation.

(Reumber following sections)

Commenter’s Reason: This modification is based on NFPA 96-2001, Section 4.2.4 in the General Requirements for “Clearance Integrity”, and NFPA 96-2001, Section 7.7.3 “Protection of Coverings and Enclosure Materials”, and the proposed change M40-02. All three imply the same thought, that is, the function, protection, repair, and inspection of enclosure materials.

Approving the change as written in M40-02 will require additional protection on all flexible duct wrap systems from POTENTIAL physical damage, even where no potential for such damage exists. The location of the duct enclosure determines whether the enclosure would be potentially subjected to damage, not the type of material used to protect the duct. All types of enclosures are potentially susceptible to physical damage, not just the flexible wrap type systems.

The modified wording in this public comment better serves the intent of the proponent’s effort by providing equal treatment of all materials used for enclosures that comply with the code. Where a duct penetration is protected with a through-penetration protection system tested in accordance with ASTM E 814 having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from the point at which the duct penetrates a ceiling wall or floor to the outlet terminal with a listed and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with nationally recognized standard for such enclosure materials.

The modified wording in this public comment better serves the intent of the proponent’s effort by providing equal treatment of all materials used for enclosures that comply with the code where necessary. Making this a general requirement, rather than a tag at the end of an exception with limited application, will provide the proper protection for all types of enclosures in the event of damage from routine operations or from a fire within the duct. This expanded modification more closely follows the intent of NFPA 96 regarding this important subject.

M40-02
506.3.11

Proposed Change as Submitted:


Revise as follows:
506.3.11 (Supp) Duct enclosure. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall only penetrate exterior walls at locations where unprotected openings are permitted by the International Building Code. Ducts shall be enclosed in accordance with the International Building Code requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings. The enclosure shall be separated from the duct by a minimum of 6 inches (152.4 mm) and a maximum of 12 inches (305 mm) except as otherwise required by Section 506.3.7. The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring or systems.

(No change to exceptions)

Proponent's Reason: The elimination of the 6-inch requirement is due to the fact that it was required for observation of the duct after a fire. This is not the way a grease duct is evaluated after a fire, the shaft will have to be opened up in several locations to enable a proper assessment.

The addition of the 3-inch clearance is based on the NFPA 96 Limited Combustible reference. It was common practice in years past to install these systems with these clearances for gypsum and this new text also requires noncombustible supporting structures. A further reduction of clearances for hoods has already been approved in current section 507.9.

The current 12-inch maximum requirement was based on the fact that it may be unsafe to install other materials within the enclosure serving grease ducts, due to heat transfer. This new language says what the intent of the code has been for many years, don't permit other items in the same enclosure. It is not logical to believe what current text says, which is that a shaft enclosure is too large if it has more than 12-inches of clearance.

Committee Action: Approved as Modified

Modify proposal as follows:

506.3.11 (Supp) Duct enclosure. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall only penetrate exterior walls at locations where unprotected openings are permitted by the International Building Code. Ducts shall be enclosed in accordance with the International Building Code requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings. The enclosure shall be separated from the duct by a minimum of 6 inches (152.4 mm) and a maximum of 12 inches (305 mm) except as otherwise required by Section 506.3.7. Clearance from the duct to the interior surface of enclosures of combustible construction shall be not less than 18 inches (457.2 mm). Clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible shall be not less than 6 inches (152.4 mm).

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Richard Licht, RRL Consulting Solutions Inc., requests Approved as Modified by the Code Development Committee.

Commenter's Reason: The proponent stated that this was already allowed in NFPA 96 and that there are no systems or enclosures available for clearance less than 6 inches as required by the codes today. The proponent also states the 6 in. was required for observation of the duct after fire and this is not the reason for the clearance. The 6 in clearance requirement was based on results of a NFPA technical committee studies on clearance to combustibles and safety requirements for grease duct fires.

First, NFPA does allow reduction in clearance for air ducts but does not allow them for Kitchen Grease ducts. NFPA 96 states the following; NFPA 96 -2001 Section 7.7.2 Enclosures Fire Resistance Rating and Enclosure Clearance. 7.7.2.2.2 Clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible shall be not less than 152.4 mm (6in.). 7.7.2.2.3 Provision for reducing clearances as described in Section 4.2 shall not be applicable to enclosures.

NFPA 96 – 98 Section 4.7.3.3 “Clearance from the duct or the exhaust fan to the interior surface of enclosures of combustible construction shall be not less than that 18 in. (457.2 mm) and clearance from the duct to the interior surface of enclosures of noncombustible or limited-combustible construction shall be not less than 6 in. (152.4 mm). Provisions for reducing clearances as described in 1-3.2 are not applicable to enclosures. Thus both NFPA 96 1998 and 2001 versions do not allow for reduction of clearance to 3 in. as stated by the proponent.

NFPA 96 committee back in 1994 conducted extensive investigations into the clearance requirements for enclosures for grease ducts and both the 1998 and 2001 versions of NFPA 96 reflect these studies and maintain the clearance to limited combustibles of 6 in. for enclosures unless they are fire tested to show reduced clearance can be allowed. Section 506.3.11 of the IMC already provides the clearance requirements for duct enclosures and limits it to a minimum of 6 in.

The flexible wrap systems have provided this type of information and there are listed systems available that provide 0 in. clearances to combustibles. I urge the membership to support the action of the committee and approve as modified M41-02.

Public Comment 2:

Vickie J. Lovell, InterCode Incorporated, representing 3M company, requests Approved as Modified by this comment.

Modify proposal as follows:

506.3.11 (Supp) Duct enclosure. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall only penetrate exterior walls at locations where unprotected openings are permitted by the International Building Code. Ducts shall be enclosed

(No change to exceptions)

Committee Reason: Based on proponent's published reason. The modification adds specific clearances from the duct to combustible and noncombustible enclosures.
in accordance with the International Building Code requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings. The enclosure shall be separated from the duct by a minimum of 6 inches and a maximum of 12 inches. Clearance from the duct to the interior surface of enclosures of combustible construction shall be not less than 18 inches (457.2 mm). Clearance from the duct to the interior surface of enclosures of noncombustible construction or gypsum wallboard attached to noncombustible structures shall be not less than 6 inches (152.4 mm). The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring or systems.

Exceptions:

1. (No change)
2. A duct enclosure shall not be required for a grease duct that penetrates only a non-fire-resistance rated roof/ceiling assembly. Requirements for clearances shall be in accordance with Section 506.3.7.

Commenter's Reason: The annex of NFPA 96-2001 has been submitted as substantiation for this modification. The illustrations from NFPA 96 clearly indicate where the intended clearances of 0 inches, 3 inches and 6 inches, 12 inches, and 18 inches between the duct and the nearest construction were intended to apply. Assuming that the IMC intends to require the similar clearances for fire rated assemblies and non-fire rated assemblies, the revised Section 506.3.11 as indicated in the 2002 Supplement, plus this modification, along with the membership’s approval with committee modifications of M 37-02 would make the two documents consistent.

For referencing purposes, the sections of the NFPA 96-2001 specified in the illustrations correspond to the following IMC sections (2002 Supplement):

NFPA 96 Section 4.2.3 is equivalent requirement to 2002 IMC 506.3.7 (as proposed in M37-02)

NFPA 96 Section 7.7.2.2 is equivalent requirement to 2002 IMC 506.3.11 (as revised in M15-00)

It appears that formatting changes and other modifications during the two supplement periods may lead to confusion in the 2003 IMC. The proposed modifications will improve use and ease of understanding of the requirements.
FIGURE A.4.2(a) Typical section view for building with two stories or more with fire-rated floor-ceiling assembly.

FIGURE A.4.2(b) Typical section view for one-story building with fire-rated floor-ceiling assembly.

Note: Clearance notes in Figure A.4.2(a) apply also to this drawing.

FIGURE A.4.2(c) Typical section view for building with two stories or more with non-fire-rated ceiling and fire-rated floor.

FIGURE A.4.2(d) Typical section view for one-story building without fire-rated roof-ceiling assembly.
M77-02
924.1 (IRC M1903.1)

Proposed Change as Submitted:

Proponent: Kelvin Hecht, International Fuel Cells, representing US Fuel Cell Council

THIS PROPOSAL IS ON THE AGENDA OF THE IMC AND THE IRC MECHANICAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1. IMC 924.1 General. Stationary fuel cell power plants having a power output not exceeding 1,000 KW, shall be tested in accordance with ANSI Z21.83 and shall be installed in accordance with the manufacturer’s installation instructions and NFPA 853.

2. IRC M1903.1 General. Stationary fuel cell power plants having a power output not exceeding 1,000 KW, shall be tested in accordance with ANSI Z21.83 and shall be installed in accordance with the manufacturer’s installation instructions and NFPA 853.

Proponent’s Reason: The reference to 1,000 KW in M1903.1 is added for consistency with Section 924.1 of the International Mechanical Code, and the scope of Z21.83.

The reference to NFPA 853 is added for completeness. NFPA 853, standard for the Installation of Stationary Fuel Cell Power Plants, was approved as an American National Standard on August 18, 2000.

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kelvin Hecht, Consultant, representing the US Fuel Cell Council, requests Approved as Submitted for Items 1 and 2.

Commenter’s Reason: This proposal was “Disapproved” because NFPA 853 was not submitted due to an oversight. This proposal references current existing standards.

Both ANSI Z21-83 and NFPA 853 are undergoing revisions. Z21-83 will be reissued as CSA FC-1 and its scope will be broadened. The 2003 Edition of NFPA 853 will address power plants below 50 Kw. I will submit proposals to address these changes in the next ICC code cycle.

Analysis: The following combinations of actions would achieve technical consistency between the IMC and the IRC:

Item 1 AS Item 2 AS
or
Item 1 D Item 2 AM

A review of NFPA 853 demonstrates compliance with Section 3.6 of the ICC code development process.

M85-02
Table 1103.1

Proposed Change as Submitted:

Proponent: Robert Guenther, City of Long Beach, CA

Revise as follows:

TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND TLV-TWA

ITEM 1 (IMC) Committee Action: Disapproved

Committee Reason: The NFPA 853 standard was not submitted for review.

Assembly Action: No Motion

ITEM 2 (IRC) Committee Action: Approved as Modified

Modify proposal as follows:

IRC M1903.1 General. Stationary fuel cell power plants having a power output not exceeding 1,000 KW, shall be tested in accordance with ANSI Z21.83 and shall be installed in accordance with the manufacturer’s installation instructions and NFPA 853.

Committee Reason: Based on proponent’s published reason. The modification deletes the new standard because it had not been submitted for review.

Assembly Action: No Motion
## AMOUNT OF REFRIGERANT PER OCCUPIED SPACE

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(No change to remainder of table)

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m³.

a CG = Compressed gas; C = Corrosive; F = Flammable; OHH = Other Health Hazard.

b Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.

c Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.

d For installations that are entirely outdoors, use 3-1-0.

e PEL or consistent occupational exposure limit on a time-weighted average (TWA) basis (unless noted C for ceiling) for an 8 hr/d and 40 hr/wk.
**Proponent's Reason:** This proposal revises existing data and adds data to the table required to enforce those sections in Chapter 11 which limit the amount of refrigerant that an area may be exposed to in the event of a refrigerant leak.

This data is the most current available and is taken from a comprehensive report prepared by James M. Calm, P.E. for the Air-conditioning and Refrigeration Technology Institute. All of the data proposed to be amended or added to the table is substantiated in the report.

These revisions are required to enforce the code and are currently being considered by ASHRAE for inclusion into Standard 34. It is anticipated that the ASHRAE consensus process will not be complete for the addition of this data into the standard for another 1 to 2 years, while the new refrigerants referenced in the table are currently being widely used.

The proposed changes to ASHRAE 34 have been through 3 public reviews and a 4th review is anticipated. To date none of the proposed data has been judged incorrect. If future ASHRAE values are approved that are different than this proposal an amendment to the IMC would obviously be submitted.

**Committee Action:** Disapproved

**Committee Reason:** Some of the new and revised data has not been through a peer review process. Some of the values were developed through methods which have not been finally approved.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

Guy Tomberlin, Fairfax County, VA, representing Virginia Plumbing and Mechanical Inspectors Association, requests Approved as Submitted.

**Commenter's Reason:** This proposal's disapproval was a total misunderstanding. It was based on the misconception that these additional quantities listed were developed by different methods than the approved proposals M79, M80, M81, M82, M83, and M84 on the same subject. This is incorrect; these quantities all came from the same source, the proposed updates to ASHRAE 34. This particular proposal contains more complete updated information, which enables Table 1103.1 to be more usable for all of the industry. Review this proposal and it will become apparent, disapproval was a mistake. This contains more quantities than all the other approved proposals and adds values where current code recognizes a product, but fails to lend guidance for amounts permitted. This will make the IMC more completely updated with all the refrigeration industry in relation to all research that has been conducted and made available.
INTERNATIONAL FUEL GAS CODE

FG1-02

101.2

Proposed Change as Submitted:

Proponent: David Johnston, Washington Gas; representing Washington Gas

1. Revise as follows:

101.2 Scope. This code shall apply to the installation of fuel gas piping systems, fuel gas utilization equipment, and related accessories as follows in accordance with Sections 101.2.1 through 101.2.4:

1. Coverage of piping systems shall extend from the point of delivery to the connections with gas utilization equipment. (See “point of delivery”.)

2. Systems with an operating pressure of 125 psig (862 kPa gauge) or less:

   Piping systems for gas-air mixtures within the flammable range with an operating pressure of 40 psig (69 kPa gauge) or less:

   LP-Gas piping systems with an operating pressure of 20 psig (140 kPa gauge) or less:

3. Piping systems requirements shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation and maintenance.

4. Requirements for gas utilization equipment and related accessories shall include installation, combustion and ventilation air and venting.

2. Add new text as follows:

101.2.1 Piping systems. These regulations cover piping systems for natural gas with an operating pressure of 125 psig (862 kPa gauge) or less, and for LP-Gas with an operating pressure of 20 psig (140 kPa gauge) or less, except as provided in Section 402.5.1. Coverage shall extend from the point of delivery to the outlet of the equipment shutoff valves. Piping systems requirements shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation and maintenance.

101.2.2 Gas utilization equipment. Requirements for gas utilization equipment and related accessories shall include installation, combustion and ventilation air and venting and connections to piping systems.

3. Revise as follows:

101.2.3 Systems and equipment outside the scope. This code shall not apply to the following:

1. Portable LP-Gas equipment of all types that are not connected to a fixed fuel piping system.

2. Installation of farm equipment such as brooders, dehydrators, dryers, and irrigation equipment.

3. Raw material (feedstock) applications except for piping to special atmosphere generators.

4. Oxygen-fuel gas cutting and welding systems.

5. Industrial gas applications using gases such as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen.

6. Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants.

7. Integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions.

8. LP-Gas installations at utility gas plants.


10. Fuel gas piping in power and atomic energy plants.

11. Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters.

12. LP-Gas equipment for vaporization, gas mixing, and gas manufacturing.

13. Temporary LP-Gas piping for buildings under construction or renovation that is not to become part of the permanent piping system.


15. Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles.

16. Except as provided in Section 401.1.1, gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in the distribution of gas, other than undiluted LP-Gas.

17. Building design and construction, except as specified herein.

18. Piping systems for mixtures of gas and air within the flammable range with an operating pressure greater than 10 psig (69 kPa gauge).

101.2.4 Other fuels. (No change to text)

Proponent’s Reason: The current text is confusing and unclear as to its intent. In particular, the two paragraphs under the current Item 2 are just hanging in the air – it is not clear if they denote systems within the scope of the code or are exceptions to item 2. As currently configured,
these provisions are unenforceable.

This proposal is entirely editorial in nature, intended to improve the format and readability of the code. This proposal reorganizes 101.2 so that it is clear which piping systems and equipment requirements are intended to be within the scope of the code. Proposed Section 102.2.1 more clearly states the scope for natural gas and LP piping systems.

The paragraph relating to the unusual circumstance of piping systems for gases within the flammable range is added to the list of items that are not within the scope of the code.

Current items #3 and #4 are out of place in a list of items covered and are better stated in a text paragraph as explanatory material.

The proposed revision divides the current text into separate piping and equipment categories as suggested by current text. The list of “not covered” items is converted to a separate subsection for consistency with the text style of the code.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: Disapproved

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful.

FG2-02

101.2

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Chair, ICC Ad Hoc Committee for Hydrogen Gas

1. Revise as follows:

SECTION 101 (IFGC)
GENERAL

101.2 Scope.
This code shall apply to the installation of fuel gas piping systems, fuel gas utilization equipment, and related accessories as follows:

1. Coverage of piping systems shall extend from the point of delivery to the connections with gas utilization equipment. (See “point of delivery”.)

2. Systems, other than hydrogen systems, with an operating pressure of 125 psig (862 kPa gauge) or less.

Piping systems for gas-air mixtures within the flammable range with an operating pressure of 10 psig (69 kPa gauge) or less.

3. Piping systems requirements shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation, and maintenance.

4. Requirements for gas utilization equipment and related accessories shall include installation, combustion and ventilation air and venting.

5. Gaseous hydrogen systems shall be regulated by Chapter 7.

This Code shall not apply to the following:

1. Portable LP-Gas equipment of all types that are not connected to a fixed fuel piping system.

2. Installation of farm equipment such as brooders, dehydrators, dryers, and irrigation equipment.

3. Raw material (feedstock) applications except for piping to special atmosphere generators.

4. Oxygen-fuel gas cutting and welding systems.

5. Industrial gas applications using gases such as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen.

6. Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants.

7. Integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions.

8. LP-Gas installations at utility gas plants.


10. Fuel gas piping in power and atomic energy plants.

11. Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters.

12. LP-Gas equipment for vaporization, gas mixing, and gas manufacturing.

13. Temporary LP-Gas piping for buildings under construction or renovation that is not to become part of the permanent piping system.
CHAPTER 2
DEFINITIONS

SECTION 202 (IFGC)
GENERAL DEFINITIONS

FUEL GAS. A natural, manufactured, liquefied petroleum or a mixture of these Fuel gases include: natural gas, manufactured gas, liquefied petroleum gas, hydrogen gas and mixtures of these gases.

2. Add new text as follows:

GASEOUS HYDROGEN SYSTEM. An assembly of piping, devices and apparatus designed to generate, contain, distribute or transport hydrogen in the gaseous form and hydrogen-containing mixtures having a minimum of 5% hydrogen gas by volume. Such systems can consist of a compressed gas container or containers, reactors and appurtenances, including pressure regulators, pressure relief devices, manifolds, pumps, compressors and interconnecting piping and tubing and controls.

PORTABLE FUEL CELL APPLIANCE. A fuel cell generator of electricity, which is not fixed in place. A portable fuel cell appliance utilizes a cord and plug connection to a grid-isolated load and has an integral fuel supply.

Proponent’s Reason:

Introduction. Hydrogen energy safety is based on three primary elements: regulatory requirements, capability of safety technology and the systemic application of equipment and procedures to minimize risks. Groups involved in the industrial scale production of hydrogen (producers) currently implement many successful proprietary methodologies for safely generating and handling large amounts of hydrogen. Hydrogen users (e.g., NASA) depend on cryo-hydrogen as a fuel and have effectively proven the safety of large scale ground and vehicle systems which support the Space Shuttle Program.

The efforts of the International Code Council Ad Hoc Committee for Hydrogen Gas (AHC) intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and hydrogen gas motor-vehicle fuel dispensing and generation stations. The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes. This, and other, related proposals is a summation of their work.

Proposed Revisions to IFGC Section 101.2—Scope. The commercial products industry is moving toward the use of hydrogen in vehicles, generators and equipment to replace petroleum-based fuels in order to reduce atmospheric emissions and facilitate a shift to the use of renewable energy supplies. Furthermore, the commercialization of fuel cells, and the goal of sustainable development has propelled hydrogen supply technology to the forefront of clean energy applications for transportation and distributed and regenerative electric power.

In many cases the hydrogen fuel is utilized, with air, within a fuel cell to produce electricity and in some cases co-generate heat. Typically, building officials will be faced with two classes of equipment – those that generate hydrogen (for use by other devices) and those that utilize hydrogen as their energy input such as a stationary fuel cell (as covered in the IFGC-§633, IMC-§924 and IRC-§M1903.1) or portable fuel cell appliances (as addressed in the IMC-§106.2 and IRC-§R105.2).

With regard to proposed Exception 18, the AHC feels that the reason to support this proposed change and related changes to the IMC (M1-00 Item 1, Approved as Submitted 11-0) and the IRC-Plumbing/Mechanical (M1-01 Item 2, Approved as Submitted 8-0) approved during last year’s cycle remains valid. Two specific stationary fuel cell power plant designs are commercially available now. An ANSI Z21.83 Standard exists for these stationary power plants and has been adopted by reference in the 2000 IMC and the 2001 Supplement to the 2000 IFGC. Regardless of the adoption and implementation of these standards and codes, the vast majority of building regulatory authorities in the U.S. has yet to see a stationary fuel cell or consider approving an installation.

In many cases, hydrogen will be utilized in a manner similar to the current use of natural gas. However, there are two important differences that cause the requirement to amend the ICC codes. First, both hydrogen and natural gas are lighter than air, but hydrogen is lighter than natural gas and thus combusts more quickly than natural gas. This means that in well-ventilated situations (e.g. outdoors) hydrogen will dissipate more quickly than natural gas, and much more quickly than either propane or gasoline, both of which have fumes that are heavier than air and will linger at an accident site. However, hydrogen and natural gas can both accumulate in unventilated pockets at the top of indoor structures and could represent a risk in such situations. Similarly, propane and gasoline fumes can accumulate at the floor level in unventilated spaces, posing a different risk. Thus ignition sources must be averted at the top of any unventilated spaces for hydrogen and natural gas, while ignition sources must be precluded near the floor for gasoline or propane vehicles indoors. Second, hydrogen is odorless, colorless and burns with a flame that is not visible to the human eye. This means that it is unlikely that people will be able to detect unsafe conditions (without appropriate instrumentation) if they develop (similar to CO accumulation in a structure).

It is important that the ICC provide building officials with the necessary tools so that they can continue to ensure public safety as the public sector begins to adopt sources of hydrogen within the energy infrastructure. Therefore, the AHC has detailed a foundation for code requirements which will allow the safe handling and use of hydrogen as a fuel. Throughout their work, the AHC has sought consistency with
existing codes and standards wherever possible. Where hydrogen standards in place today, do not cover the full scope of use or range of available or anticipated technologies, the AHC actively worked with a diverse group of technical and advisory parties from industry to establish criteria in the model codes to cover the installation and integration of these technologies with the building or facilities with which they are associated.

It is important to note that a given volume of natural gas has more than three times the energy of the same volume of hydrogen. Therefore, a given volume of pipe containing natural gas will contain the same energy (potential hazard) as a three times larger volume of hydrogen (see “Comparison of Motor Fuels” attached).

The revisions proposed to Section 101.2 along with the more specific requirements detailed in this proposal clearly define gaseous hydrogen within the scope of the International Fuel Gas Code (IFGC), and allow gaseous hydrogen to be stored and generated indoors not unlike natural gas, provided specific safeguards are implemented. All portions of the system are designed to be safe to provide adequate safety under “worst case” conditions.

Proposed Definitions to IFGC Section 202, FUEL GAS. The AHC believes the current definition in the IFGC for FUEL GAS to be a potential source of nonuniform interpretation and nonuniform enforcement if this code were to cover gaseous hydrogen as a fuel gas. The current form of the definition reads as follows: FUEL GAS. A natural, manufactured, liquefied petroleum or as a mixture of these. The proposed definition adds clarity and is consistent with NFPA 54/ANSI Z223.1 National Fuel Gas Code (a.k.a., IFDS) which defines gases as follows: GASES -- Include natural gas, manufactured gas, liquefied petroleum (LP) gas in the vapor phase only, liquefied petroleum gas-air mixtures, and mixtures of these gases, plus gas-air mixtures within the flammable range, with the fuel gas or the flammable component of a mixture being a commercially distributed product. Through reasonable interpretation of the code text, the term “manufactured” as it pertains to gas, could be construed as applying to hydrogen. Alternatively, the word “hydrogen” or the phraseology “gas-air mixtures within the flammable range,” could secure the same intent in the current form of the code.

GASEOUS HYDROGEN SYSTEM. Section 202 currently does not define GASEOUS HYDROGEN SYSTEM. In as much as the IFGC by interpretation applies to Hydrogen and would explicitly apply with the clarification provided in the prior definition proposed for FUEL GAS, it is imperative that the proposed definition be added to the IFGC. This definition is derived from the IFC Compressed Gases and NFPA 50A. It is the International Code Council Ad Hoc Hydrogen (H2) Committee’s intent that appurtenant systems apply to natural gas piping, hydrogen de-sulfurizers, etc., necessary to support operation of the gaseous H₂ system.

PORTABLE FUEL CELL APPLIANCE. Portable fuel cell appliances are quickly reaching their deployment potential and will be commercially available from neighborhood hardware and appliance stores shortly. To the extent that these devices become permanent, a reference to the exception and definition in the code specific to portable fuel cell appliances will provide the code official the necessary information to discern whether these appliances and their associated equipment are “stationary,” as subject to the provisions of the IFGC or “portable,” and therefore exempt.

In their reason for disapproval the 2001 IFGC Code Development Committee cited an inherent understanding on behalf of all code users that the IFGC does not intend to address “portable” appliances. The presumption that all code users hold this view as self evident, especially as it pertains to emerging fuel cell technologies, does nothing to assist building regulatory officials who enforce the IFGC to assess fuel cell installations proposed in their jurisdictions. Furthermore, if this view is indeed self evident, is there a need for existing Exceptions 1), 2), 4), and 15) to IFGC Section 101.2 as they pertain to “portable” LF-Gas equipment, farm equipment, welding systems, and vehicles, respectively?

In Summary. The AHC has developed these changes through the consultation of a diverse group of technical and advisory parties from various parties in the hydrogen community, inclusive of industry, professional associations, testing laboratories, agencies of government, academic and research institutions and believes it important to provide a template for thorough coverage in the International Codes of equipment, appliances and vehicles that will utilize hydrogen as a fuel such that regulators have a sound technical basis on which to verify installation and to uphold the standard of health and safety for the citizens of their jurisdictions.

Industry is ready to commercialize hydrogen energy systems. The AHC urges your APPROVAL of this proposal “as submitted”.

Committee Action: Disapproved

Committee Reason: The proposed text provides no coverage for system pressure limits. A hydrogen/inert gas mixture is not mandated thus flammable mixtures would be allowed. Section 102.1 has wide application which is not addressed in proposed text. The proposed text opens up applications which are not covered by the code. The proposed text would open up hydrogen applicability to all occupancies including dwellings. Hydrogen has a low specific gravity and is hard to contain. The hydrogen ad hoc committee had no members in tune with the IFGC issues. The proposed text does not require certified piping installers. The IFGC committee has no hydrogen expertise. Hydrogen coverage should be in a separate code. The IFC committee excluded indoor fueling operations. Vehicle fueling coverage belongs in the IFC. The proposed text has some unenforceable provisions.

Assembly Action: Approved as Submitted

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted and an assembly action was successful.

Public Comment 1:

Gilbert Gonzales, Murray City Corp., requests Approved as Submitted.

Commenter’s Reason: The proposed text does not address every possible scenario nor is it a perfect document. However, as with any new technology the industry must have a reasonable and enforceable base from which to regulate the safe installation and delivery of hydrogen gas. The Ad Hoc Committee for Hydrogen Gas has made every conceivable attempt to provide the Fuel Gas Code Committee and the ICC membership with just that. The comment made in the committee reasoning that states the ad hoc committee had no members in tune with fuel gas issues is incorrect. The original proposal noted that “The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes.” The fact that hydrogen is a fuel gas, would make the Fuel Gas Code the logical choice for these requirements. To address the code requirements for hydrogen gas through a separate code is both unreasonable and impractical.

Public Comment 2:

ICC Ad Hoc Committee for Hydrogen Gas, requests Approved as Modified by this comment.
Modify proposal as follows:

SECTION 101 (IFGC)
GENERAL

101.2 Scope.
This code shall apply to the installation of fuel gas piping systems, fuel gas utilization equipment, and related accessories as follows:

1. Coverage of piping systems shall extend from the point of delivery to the connections with gas utilization equipment. (See “point of delivery”.)
2. Systems, other than hydrogen storage vessels and equipment used for the storage, generation, compression or dispensing of hydrogen systems, with an operating pressure of 125 psig (862 kPa gauge) or less.

Piping systems for gas-air mixtures within the flammable range with an operating pressure of 10 psig (69 kPa gauge)

LP-Gas piping systems with an operating pressure of 20 psig (140 kPa gauge) or less.

3. Piping systems requirements shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation, and maintenance.

4. Requirements for gas utilization equipment and related accessories shall include installation, combustion and ventilation air and venting.

5. Gaseous hydrogen systems shall be regulated by Chapter 7.

This Code shall not apply to the following:

1. Portable LP-Gas equipment of all types that are not connected to a fixed fuel piping system.
2. Installation of farm equipment such as brooders, dehydrators, dryers, and irrigation equipment.
3. Raw material (feedstock) applications except for piping to special atmosphere generators.
4. Oxygen-fuel gas cutting and welding systems.
5. Industrial gas applications using gases such as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen.
6. Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants.
7. Integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions.
8. LP-Gas installations at utility gas plants.
10. Fuel gas piping in power and atomic energy plants.
11. Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters.
12. LP-Gas equipment for vaporization, gas mixing, and gas manufacturing.
13. Temporary LP-Gas piping for buildings under construction or renovation that is not to become part of the permanent piping system.
15. Installation of hydrogen gas, LP-Gas and compressed natural gas (CNG) systems on vehicles.
16. Except as provided in Section 401.1.1, gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in the distribution of gas, other than undiluted LP-Gas.
17. Building design and construction, except as specified herein.
18. Portable fuel cell appliances that are neither connected to a fixed piping system nor interconnected to a power grid.

CHAPTER 2
DEFINITIONS

SECTION 202 (IFGC)
GENERAL DEFINITIONS

FUEL GAS. Fuel gases include: natural gas, manufactured gas, liquefied petroleum gas, hydrogen gas and mixtures of these gases.

GASEOUS HYDROGEN SYSTEM. See Section 702.1. An assembly of piping, devices and apparatus designed to generate, contain, distribute or transport hydrogen in the gaseous form and hydrogen-containing mixtures having a minimum of 5% hydrogen gas by volume. Such systems can consist of a compressed gas container or container, reactors and apparatus, including pressure regulators, pressure relief devices, manifolds, pumps, compressors and interconnecting piping and tubing and controls.

PORTABLE FUEL CELL APPLIANCE. A fuel cell generator of electricity, which is not fixed in place. A portable fuel cell appliance utilizes a cord and plug connection to a grid-isolated load and has an integral fuel supply.

Commenter’s Reason: In their reason for disapproval the Code Development Committee cited the following technical issues:

1) Definition of hydrogen gas is incomplete.
2) Lacks limits on pressure.
3) Lacks piping leak test criteria
4) Lacks specific piping material and identification requirements.
5) Confusion with regard to location of ventilation openings.
6) Confusion with regard to location of ignition sources.
7) Lacks requirements for certified piping installers.
8) A general concern for indoor refueling hazards.
9) A general concern that liquefied hydrogen is beyond scope.
10) A general concern that commingling provisions for hydrogen with existing language could lead to confusion.

The AHC has addressed and resolved the technical issues identified by the Code Development Committee directly as modified by this and other coordinated public comments to all hydrogen-related proposals (F176, M7, FG2, FG15, FG41 & FG48). The following Reason in support provides a brief explanation of each solution:

Specifically:

1) The definition, GASEOUS HYDROGEN SYSTEM, has been revised; first, to establish the threshold criterion requiring the use of IFGC hydrogen provisions, and second to clarify the upper limit on the balance of non-ignitable gases in the mixture as distributed in the piping system. The definition is explicit in that the mixture is nontoxic and outside the flammable range.
There is a perception that the delivery of a hydrocarbon-based fuel as feedstock and subsequent generation of hydrogen from that feedstock somehow conflicts with the term “point-of-delivery” as defined by the IFGC. This is not the case. In fact, the two definitions are complimentary. The hydrocarbon-based fuel (feedstock) service ends and the hydrogen system begins as soon as the feedstock fuel service reaches the first piece of process equipment (e.g., desulfurizer or catalyst bed), as defined by the term GASEOUS HYDROGEN SYSTEM.  

2) An upper pressure limit for general hydrogen distribution piping similar to that for natural gas (125 psig) is specified. However, a similar pressure limitation for storage, generation and dispensing systems was dismissed on grounds that establishing such a limit could unnecessarily restrict the fuel transfer process—compressed gas storage pressures must be high to accomplish the closed-transfer of fuel to the vehicle. In that regard, the upper pressure limit could be as high or higher than currently required for Natural Gas Vehicle (NGV) fuel-dispensing operations. Moreover, no such pressure limitation exists in NFPA 51, to which the IFC refers the user for the design of gaseous hydrogen systems today.

3) The requirements of ASME B31.3, Process Piping, are referenced for the testing and inspection of gaseous hydrogen piping.

4) Stainless steel piping has been used by the space program and industry successfully for a number of years and is recommended as the minimum standard for material performance. Table A.5.1 of NASA’s “Standard Safety for Hydrogen Systems”, lists among others, Types 304, 304L and 316 as being suitable for both gaseous and liquid hydrogen service. Requirements for identification are added similar to IFC Section 3003.2.

5) Clarifying language has been added to specify the location of the openings for venting a hydrogen leak such that the both openings are located entirely within 12-inches of the garage ceiling and floor in the same wall.

6) Provisions for ventilation were reformatted to address the number of hydrogen vehicles served, a floor area allowance consistent with the current IMC threshold for garages (IMC Table 403.3, Footnote ‘d’), the location of ignition sources (e.g., garage door opener), and establishing an upper generation limit for on-demand hydrogen generators, all consistent with ongoing research at the University of Miami, Coral Gables. A given standard of safety is met by the chosen set of restrictions. The AHC’s choice of hydrogen leakage rates and ignition source location produce the highest level of safety.

7) ASME B31.3, Process Piping as referenced for the design and installation of piping systems, establishes certification requirements for piping installers. Training is not required beyond the provisions of ANSI B31.3.

8) Provisions for indoor generation, compression, storage and dispensing equipment have been reworked in response to clarifications requested by the IFC Committee (see F176-02). The exceptions proposed by F176-02 As Modified by Public Comment (AMPC) are intended for the purpose of clearly establishing provisions already allowed by other sections of the IBC and IFC. Additionally, where a maximum allowable quantity threshold in the IFC is exceeded, the proposed language would require the construction of the appropriate H occupancy to accommodate such indoor generation or refueling operations.

9) Provisions associated with the vaporization of liquefied hydrogen for gaseified applications have been consolidated into a single new Chapter 7 for hydrogen gas, FGC41-02 As Modified by Public Comment (AMPC).

10) To address concerns that a user could confuse or otherwise commingle newly proposed hydrogen provisions with those existing for natural and LP gas, the AHC has consolidated all provisions for hydrogen in one new Chapter 7.

The AHC is comprised of 3 regulators (a fire official, a mechanical official, and an environmental specialist) representing general interests; 5 producer interests representing the utility, testing laboratory, petroleum, automotive and combined gas/chemical processing industries, respectively; and a researcher representing user interests.

Throughout their work, the AHC has sought consistency with existing codes and standards wherever possible and recommends inclusion of provisions for gaseified hydrogen in the Fuel Gas Code. The AHC urges your approval of this proposal AS MODIFIED by this PUBLIC COMMENT (AMPC).

Public Comment 3:  

Jim Ranfone, American Gas Association requests Disapproved.

Commenter’s Reason: The American Gas Association (AGA) supports the IFGC Committee action for disapproval. In addition to the Committee Reason for disapproval documented in the Report on the Public Hearing, additional reasons addressed in the public hearing testimony by AGA and others include the following:

1) Coverage of hydrogen and hydrogen applications is already addressed in ICC codes other than the IFGC, most notably the International Fire Code (IFC) which already covers storage cylinders and containers among other aspects of hydrogen storage and handling.

2) The current coverage of these codes is insufficient, proposals to expand coverage for hydrogen should be directed to those codes. As for hydrogen applications such as fuel cells and vehicles that would use fuel gases as a feedstock (the most commonly cited scenario for hydrogen end use), the IFGC already provides coverage for these applications, including coverage of piping systems serving both listed and unlisted equipment. No additional coverage for these applications is needed.

3) The proposal’s definition of hydrogen in the scope of the IFGC, as well as in accompanying proposals, is ambiguous and opens up questions about hydrogen safety not currently at issue for fuel gases. For example, the proposal provides no restriction on piping pressures or compositions including flammable mixtures, two areas explicitly treated in the IFGC and in field practice for fuel gas installations. As a result, the proposal does not provide minimum requirements for hydrogen consistent with the requirements for fuel gases under the code. In testimony, proponents could not address these issues because of a lack of clarity of the ultimate applications of interest for hydrogen-based fuels. Perhaps when greater clarity of the applications is presented, the appropriateness of proposed minimum requirements in the appropriate codes can be better evaluated.

4) The proposal does not address other important issues of the scope of the IFGC. The scope states that, “Coverage of piping systems shall extend from the point of delivery to connections with gas utilization equipment.” However, the definition of “point of delivery” in the IFGC is incompatible with delivery of hydrogen. The proposal does not address this issue.

AGA supports the development of sound code or standards coverage of hydrogen and hydrogen systems under the ICC. AGA advocates the
expeditious development of a separate, stand-alone code or standard for hydrogen systems. In order to maintain the integrity of ICC documents as model codes, proponents of code coverage for hydrogen and hydrogen systems need to address deficiencies identified in the current proposals.

**FG3-02**

**Proposed Change as Submitted:**

**Proponent:** John Terry, Chair; representing the International Existing Building Code Drafting Committee

1. Revise as follows:

**102.2.1 Existing buildings.** Additions, alterations, renovations or repairs related to building or structural issues shall be regulated by the *International Existing Building Code*.

**102.4 Additions, alterations or repairs.** Additions, alterations, renovations or repairs to installations shall conform to that required for new installations without requiring the existing installation to comply with all of the requirements of this code. Additions, alterations or repairs shall not cause an existing installation to become unsafe, hazardous or overloaded.

Minor additions, alterations, renovations and repairs to existing installations shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system, is not hazardous and is approved.

Additions, alterations, renovations and repairs to electrical systems shall comply with the provisions of the *International Existing Building Code* and this code, as applicable.

**402.6 Historic buildings.** The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings. The provisions of the *International Existing Building Code* shall apply to historic buildings.

**201.3 Terms defined in other codes.** Where terms are not defined in this code and are defined in the ICC *Electrical Code*, *International Building Code*, *International Fire Code*, *International Mechanical Code*, or *International Plumbing Code*, or the *International Existing Building Code* such terms shall have meanings ascribed to them as in those codes.

**302.1 Structural safety.** The building shall not be weakened by the installation of any gas piping. In the process of installing or repairing any gas piping, the finished floors, walls, ceilings, tile work or any other part of the building or premises which are required to be changed or replaced shall be left in a safe structural condition in accordance with the requirements of the *International Existing Building Code*.

**Chapter 7**

Add IEBC-2003 reference to standards under ICC.

**Proponent’s Reason:**

1. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings. The International Existing Building Code (IEBC), 2003 Final Draft, was published in August of 2001. The proposed code change submitted here is part of a larger package of code changes submitted to all International Codes for coordination and correlation with the International Existing Building Code.

2. 102.6-The IEBC contains comprehensive provisions for historic buildings.

3. 201.3-The International Existing Building Code is added as many terms related to existing buildings such as that discussed for historic buildings are found in the IEBC.

4. 302.1-Any change or modification to walls, floors, ceiling and other building elements as a result of fuel gas work, will create a category of work under the provision of the IEBC and therefore a reference to the IEBC is needed to alert the code user to the possibility of requirements that might be triggered.

**Committee Action:** Disapproved

**Committee Reason:** Reference to electrical systems does not belong in Section 102.4. The IEBC is still in the draft stage. Disapproval is consistent with action for other ICC code committees. It is not appropriate for the IEBC to usurp the IBC.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.

**Public Comment:**

John Terry, State of New Jersey, requests Approved as Modified by this comment.

**Modify proposal as follows:**

**102.2.1 Existing buildings.** Additions, alterations, renovations or repairs related to building or structural issues shall be regulated by the *International Existing Building Code*. 

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2002 ICC FINAL ACTION AGENDA 489
102.4 **Additions, alterations or repairs.** Additions, alterations, renovations and repairs to electrical fuel gas systems shall comply with the provisions of the *International Existing Building Code* and this code, as applicable.

102.6 **Historic buildings.** The provisions of the *International Existing Building Code* shall apply to historic buildings.

201.3 **Terms defined in other codes.** Where terms are not defined in this code and are defined in the ICC Electrical Code, *International Building Code*, *International Fire Code*, *International Mechanical Code*, or *International Plumbing Code*, or the *International Existing Building Code* such terms shall have meanings ascribed to them as in those codes.

302.1 **Structural safety.** The building shall not be weakened by the installation of any gas piping. In the process of installing or repairing any gas piping, the finished floors, walls, ceilings, tile work or any other part of the building or premises which are required to be changed or replaced shall be left in a safe structural condition in accordance with the requirements of the *International Existing Building Code*.

**IFGC/IFGS CHAPTER 7 REFERENCED STANDARDS**

<table>
<thead>
<tr>
<th>Standard reference number</th>
<th>Title in code section number</th>
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<tbody>
<tr>
<td>IEC-2003</td>
<td>International Existing Building Code</td>
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**Commenter’s Reason:** This code change was originally Disapproved. The incorrect reference to “electrical systems” in Section 102.4 of the original code change proposal has been changed to the correct reference to “fuel gas systems”. The Section dealing with historic buildings has been deleted as historic buildings are existing buildings and they are addressed in Section 102.2.1. The revisions shown in Section 302.1 incorporate revisions submitted on the floor of the committee hearings in Pittsburgh. This revision keeps the reference to the IBC, allowing the administrative sections of that code to make proper reference to the IEBC for repairs.

The international fuel gas code development committee stated in their reason that the “IEBC is still in draft form”. Contrary to the reported reason for Disapproval, the IEBC is, in fact, complete and is undergoing maintenance of provisions in the 2002 Cycle, just like all the I-codes. In recognition of this fact, the IBC General Committee approved code change proposal G133, that replaces the current text of 2000 IBC chapter 34, Existing Structures, with a reference to the IEBC. The IEBC Drafting process was very similar to the process used to develop the IBC - a committee developed a draft(s) which was then exposed to the rigors of the ICC Code Development Process. The 2003 IEBC will be part of the 2003 family of International Codes. The ICC Board of Directors established the IEBC Drafting Committee and charged it with the responsibility of drafting a code to have comprehensive provisions for existing buildings. The *International Existing Building Code* (IEBC), 2003 Final Draft, was published in August of 2001.

The IEBC Drafting Committee respectfully requests the membership approval of this public comment (AM)

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**Proposed Change as Submitted:**

**Proponent:** James Ranfone, American Gas Association; representing AGA

**Delete without substitution:**

**SECTION 202 DEFINITIONS**

**CONFINED SPACES.** A space having a volume less than 50 cubic feet per 1,000 British thermal units per hour (Btu/h) (4.8 m³/kW) of the aggregate input rating of all appliances installed in that space.

**UNCONFINED SPACE.** A space having a volume not less than 50 cubic feet per 1,000 Btu/h (4.8 m³/kW) of the aggregate input rating of all appliances installed in that space. Rooms communicating directly with the space in which the appliances are installed, through openings not furnished with doors, are considered a part of the unconfined space.

**UNUSUALLY TIGHT CONSTRUCTION.** Construction meeting the following requirements:

1. Walls and ceilings exposed to the outside atmosphere having a continuous water vapor retarder with a rating of 1 perm (57 ng/s · m² · Pa) or less with openings gasketed or sealed; and
2. Storm windows or weatherstripping on operable windows and doors; and
3. caulking or sealants applied to areas, such as joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, and penetrations for plumbing, electrical and gas lines, and at other openings.

**Proponent’s Reason:** To coordinate the IFGS and the IFGC provisions. The 2002 National Fuel Gas Code (NFGC) has eliminated the use of these three terms in its revised combustion air provisions. Since the IFGC excerpts all of the NFGC’s combustion air provisions, the terms will no longer appear in the code and, therefore, there is no need to define them.

**Committee Action:** Approved as Submitted

**Committee Reason:** Based on proponent’s published reason.

**Assembly Action:** No Motion

**Individual Consideration Agenda**

This item is on the agenda for individual consideration because a public comment was submitted.
Public Comment:

David Johnston, Washington Gas, requests Approved as Modified by this comment.

James Ranfone, American Gas Association, requests Approved as Modified by this comment.

Modify current text as follows:

303.3 Prohibited locations. Appliances shall not be located in, or obtain combustion air from, any of the following rooms or spaces:
1. Sleeping rooms.
2. Bathrooms.
3. Toilet rooms.
4. Storage closets.
5. Surgical rooms.

Exceptions:

1. Direct vent appliances that obtain all combustion air from the outdoors.
2. Vented room heaters, wall furnaces, vented decorative appliances and decorative appliances for installation in vented solid-fuel burning fireplaces, provided that the room is a confined space and the building is not of unusually tight construction.
3. A single wall-mounted unvented room heater equipped with an oxygen depletion safety shutoff system and installed in a bathroom provided that the input rating does not exceed 6,000 Btu per hour (1.76 kW) and the bathroom is not a confined space.
4. A single wall-mounted unvented room heater equipped with an oxygen depletion safety shutoff system and installed in a bedroom provided that the input rating does not exceed 10,000 Btu per hour (2.93 kW) and the bedroom is not a confined space.

Appliances installed in a dedicated enclosure in which all combustion air is taken directly from the outdoors, in accordance with Section 304.11. Access to such enclosure shall be through a solid door, weather-stripped in accordance with the exterior door leakage requirements of the International Energy Conservation Code and equipped with an approved self-closing device.

Commenter’s Reason: We support the committee action to remove the definitions of Confined Space, Unconfined Space, and Unusually Tight Construction, since these terms will no longer be used in Section 304. However, the terms are still used in Section 303.3, as was pointed out at the Public Hearing. This comment would modify Section 303.3 to eliminate the terms and replace them with a functionally equivalent reference to the new combustion air coverage. The proposed references in 303.3 to the new coverage in 304.2 will provide the same or better coverage for appliances in bedrooms and bathrooms as does the current language.

FG15-02

305.2

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Chair, ICC Ad Hoc Committee for Hydrogen Gas

1. Revise as follows:

305.3 (Supp) Elevation of ignition source. Equipment and appliances having an ignition source shall be elevated such that the source of ignition is not less than 18 inches (456 mm) above the floor in hazardous locations and public garages, private garages, repair garages, automotive service stations and parking garages where flammable liquids or flammable gases heavier than air are present. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Exception: Elevation of the ignition source is not required for appliances that are listed as flammable vapor resistant and for installation without elevation.

2. Add new text as follows:

305.4 Hydrogen Generating and Refueling Operations. In rooms or spaces that contain hydrogen generating or refueling systems, equipment and appliances having an ignition source shall be located such that the ignition source is not less than 24 inches (575 mm) below the ceiling in hazardous locations and public garages, private garages, repair garages, automotive service stations and parking garages. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Exception: This section shall not apply where rooms or spaces that contain hydrogen generating or refueling systems are ventilated in accordance with Section 502.15 of the International Mechanical Code and one of the following:

1. The ventilation system shall be designed to maintain the maximum concentration of flammable gas below 25 percent of the lower flammability limit of the substance for the expected room temperature; or

2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot ([0.0051m3/(s x m2)] of floor area of the room.

305.4.1 Natural Ventilation. Rooms or spaces located underneath or adjacent to habitable space and intended for hydrogen generating or refueling operations shall be provided with mechanical ventilation as required by the exception to Section 305.4 or shall communicate with the outdoors in accordance with Sections 305.4.1.1 through 305.4.1.2. The minimum cross-sectional dimension of air openings shall be 3 in. (76 mm). Where ducts are used,
they shall be of the same cross-sectional area as the free area of the openings to which they connect.

305.4.1.1 Two openings. Two permanent openings, one commencing within 12 inches (305 mm) of the ceiling of the garage, and one commencing within 12 inches (305 mm) of the floor of the garage, shall be provided. The openings shall communicate directly with the outdoors. Each opening shall directly communicate with the outdoors horizontally, and have a minimum free area of ½ square foot per 1,000 cubic feet of garage volume.

305.4.1.2 Louvers and grilles. In calculating free area required by Section 305.4.1.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Louvers and grilles shall be fixed in the open position.

305.4.2 Specially engineered installations. As an alternative to the provisions of Section 305.4.1, the necessary supply of air for ventilation and dilution of flammable gases shall be provided by an approved engineered system.

Proponent’s Reason: Hydrogen energy safety is based on three primary elements: regulatory requirements, capability of safety technology and the systemic application of equipment and procedures to minimize risks. Groups involved in the industrial scale production of hydrogen (producers) currently implement many successful proprietary methodologies for safely generating and handling large amounts of hydrogen. Hydrogen users (e.g., NASA) depend on cryo-hydrogen as a fuel and have effectively proven the safety of large scale ground and vehicle systems which support the Space Shuttle Program.

The efforts of the International Code Council Ad Hoc Committee for Hydrogen Gas (AHC) intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and hydrogen gas motor-vehicle fuel dispensing and generation stations. The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes. This, and other, related proposals is a summation of their work.

IFGC Section 305.2. Ventilation, whether natural or mechanical, cannot remove all risk from combustible gas leaking into a garage. Based on ongoing research into the dispersion characteristics of gaseous hydrogen, and conducted at the University of Miami, Coral Gables, ½ square foot of opening area per 1,000 cubic feet of garage volume greatly reduces risk, assuming upper and lower openings of approximately equal areas are used. In addition, relying entirely on natural (i.e., passive) ventilation, the ventilation exchange rate increases with increasing hydrogen concentration due to the buoyancy of hydrogen. This is in contrast to mechanical (i.e., active) ventilation, which remains at a constant rate despite any change in hydrogen concentration.

The following is a comparison of a ventilated garage with an unventilated garage, for three leakage rates. The leakage rates were 1.0, 4.0 and 13.0 SCFM. It should be stated clearly that the findings of the University of Miami are based on leakage at the refueling interface and not the vehicle fuel tank. The AHC feels this is a reasonable assumption given the very real potential for the future installation of remote home gaseous hydrogen refueling appliances.

The comparisons of hydrogen accumulation in the garage show the reduction in risk with garage ventilation. The comparisons were made after 20 minutes of leakage. If a garage has openings, the hydrogen accumulation has reached relative equilibrium after 20 minutes and does not continue to increase appreciably with time. If a garage is not ventilated the hydrogen will continue to accumulate with time and eventually produce a hazardous environment.

The two garages, in Figures C1 through C6, are identical with the exception that the first garage did not have an upper opening. Both garages have lower openings which spanned the lower edge of the garage door. The openings were sized at ½ ft²/1000 ft² of garage volume. The leak was assumed to occur at the vehicle-filling interface, as this type of leakage is difficult to detect. The filling interface was located on the rear passenger side fender. The garage was 9 feet 2.5 inches high by 12 feet 2 inches wide by 21 feet long.

Figures C1 and C2 show the results of hydrogen leaking at 1 SCFM for 20 minutes. The garage without an upper opening is shown in figure C1. The red lines are a surface of constant 4.1% concentration. 4.1% concentration is the lean limit of combustion for hydrogen. It can be seen that a layer of burnable gases approximately 9 inches thick were trapped against the garage ceiling. The blue lines represent a surface of constant 0.82% hydrogen (20% of the lean limit of combustion). They exist down to a level approximately 28 inches below the ceiling. The result of using both lower and upper openings can be seen in figure C2. No appreciable burnable (4.1% hydrogen concentration) gases exist in the garage and the gases, which are richer than 20% of the lean limit of combustion, are only 21 inches thick. As the leak continues the upper garage will continue to fill with greater amounts of hydrogen while lower garage will stay at a relatively constant concentration.

As seen in figure C3 and C4, a 4.0 SCFM leak of hydrogen produces a burnable mixture in both garages. The layer of combustible gases in the lower garage (figure C4 with upper and lower openings) was about 11.0 inches thick, as opposed to 34 inches thick, and contained less than 1/10 the energy of the upper garage (figure C3). The severity of an accident would be substantially reduced by the lower energy content of the burnable gases in figure C4. The buoyancy of hydrogen created an 83 SCFM ventilation rate in the garage in figure C4.

As seen in figure C5, a 20-minute 13.0 SCFM leak of hydrogen almost completely filled the garage with a burnable mixture if no upper opening was provided. The ventilated garage (figure C6) contained a burnable layer approximately 22 inches thick. This was noticeably less than in the unventilated garage with a 4 SCFM leak (figure C4) and contained less than half the energy. The buoyancy of hydrogen created a 123 SCFM ventilation rate in the garage in figure C6.

The SAE Fuel Cell Vehicle (FCV) Standards Committee has been monitoring and contributing to the work of the AHC and is aware of the AHC’s decision to require additional natural or mechanical ventilation ONLY in rooms or spaces intended for hydrogen generating or refueling operations. To be explicitly clear it is NOT the intent of the AHC to require additional natural or mechanical ventilation in areas solely dedicated to the parking/storage of hydrogen-fueled vehicles (i.e., where no hydrogen generating or refueling operation is present).

Therefore, to inform the U.S. Building Regulatory Community of measures the SAE Fuel Cell Vehicle (FCV) Standards Committee plans to take to ensure safety, the Safety Working Group of the SAE FCV Standards Committee is currently preparing two “recommended practices”. The following recommendations have been incorporated into drafts of these standards to address hydrogen safety for the situation cited above:

1. Fuel systems will be designed and built to appropriate standards and leak tested to demonstrate integrity.
2. Performance-based requirements related to parking an FCV in a single-bay residential garage have been established. The standard requires validation testing in a garage with very low natural ventilation (of only 0.2 air exchanges per hour) to ensure that the vehicle is normally capable of being safely stored in a residential garage.
3. The vehicle manufacturer (VM) is required to perform a Failure Mode and Effects Analysis (FMEA) for the vehicle. If a single failure could lead to hazardous event, the vehicle manufacturer is required to modify the system to preclude the failure mode, add failsafe or redundant design measures to prevent the failure, or improve the integrity of components and systems such that risks of these failures are acceptably minimal.

4. If the vehicle manufacturer (VM) is unable to meet any of the above requirements, then the VM shall caution the owner/operator of the vehicle of any operating or parking restrictions.

SAE trusts that the U.S. Building Regulatory Community will find these measures suitable for product introduction. As operating experience is accrued with these new types of vehicles, both SAE and the ICC may need to reassess the situation and provide additional measures for FCV safety as necessary.

Thus, in crafting the proposed language specific to ventilation, the AHC has reviewed the findings of the University of Miami and takes the position that existing provisions for mechanical ventilation of residential garages are not enforced. In concert with these findings and our confidence in the SAE Safety Working Group’s investigations into failure mode analyses for hydrogen-fueled vehicle design, the AHC has recommended both natural and mechanical ventilation alternatives for private garages located underneath living space and intended for hydrogen generating or refueling operations. For the natural ventilation alternative, the proposed ½ ft.² of net free area per 1,000 cubic feet of garage floor area represents a minimum. This level of ventilation provides more than a 100 SCFM mechanical area per 1,000 cubic feet of garage floor area represents a minimum. University of Miami study could be obtained by larger opening areas.

Protection against higher leakage rates than those represented in the International Codes of equipment, appliances and vehicles that will be part of the private garage.

In Summary. The AHC has developed these changes through the consultation of a diverse group of technical and advisory parties from various parties in the hydrogen community, inclusive of industry, professional associations, testing laboratories, agencies of government, academic and research institutions and believes it important to provide a template for thorough coverage in the International Codes of equipment, appliances and vehicles that will utilize hydrogen as a fuel such that regulators have a sound technical basis on which to verify installation and to uphold the standard of health and safety for the citizens of their jurisdictions.

The industry is ready to commercialize hydrogen energy systems. The AHC urges your APPROVAL of this proposal “as submitted”.

Committee Action: Disapproved

Committee Reason: Disapproval is consistent with action taken on FG2-02. The proposed coverage needs to be technically improved before it is suitable for inclusion in the IFGC. The proposed text contains technical flaws and omissions of coverage.

Assembly Action: Approved as Modified

1. No change to current Section 305.3 (current text of Section 305.3 remains unchanged)

2. Add new text as follows:

CHAPTER 7
GASEOUS HYDROGEN SYSTEMS

SECTION 701 (IFGC)
GENERAL

This item is on the agenda for consideration because a public comment was submitted and an assembly action was successful.

Public Comment 1:

Gilbert Gonzales, Murray City Corp., requests Approved as Submitted.

Commenter’s Reason: The proposed text does not address every possible scenario nor is it a perfect document. However, as with any new technology the industry must have a reasonable and enforceable base from which to regulate the safe installation and delivery of hydrogen gas. The Ad Hoc Committee for Hydrogen Gas has made every conceivable attempt to provide the Fuel Gas Code Committee and the ICC membership with just that. The comment made in the committee reasoning that states the ad hoc committee had no members in tune with fuel gas issues is incorrect. The original proposal noted that “The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes.” The fact that hydrogen is a fuel gas, would make the Fuel Gas Code the logical choice for these requirements. To address the code requirements for hydrogen gas through a separate code is both unreasonable and impractical.

Public Comment 2:

ICC Ad Hoc Committee for Hydrogen Gas, requests Approved as Modified by this comment.

Modify proposal as follows:

704.4 703.1 Hydrogen Generating and Refueling Operations. in rooms or spaces that contain hydrogen generating or refueling systems, equipment and appliances having an ignition source shall be installed in such a manner that the system is less than 24 inches (610 mm) below the ceiling in hazardous locations and Ventilation shall be required in accordance with Section 703.1.1, 703.1.2 or 703.1.3 in public garages, private garages, repair garages, automotive service stations and parking garages which contain hydrogen generating appliances or refueling systems. Such spaces shall be used for the storage of not more than three hydrogen-fueled passenger motor vehicles and have a floor area not exceeding 850 square feet. The maximum rated output capacity of hydrogen generating appliances shall not exceed 4 SCFM of hydrogen for each 250 square feet of floor area in such spaces. Such equipment and appliances shall not be installed in Group H occupancies unless the occupancy is specifically designed for hydrogen use; or in control areas where open-use, handling or dispensing of combustible, flammable or explosive materials occurs. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Exception: This section shall not apply where rooms or spaces that contain hydrogen generating or refueling systems are ventilated in accordance with Section 502.15 of the International Mechanical Code and one of the following:

4. The ventilation system shall be designed to maintain the maximum concentration of flammable gas below 25 percent of the lower flammability limit of the substance for the expected
2.) Gaseous dispersion analysis supporting the ventilation requirements, although cited in the original proposals, was not presented in a form that can be reviewed by someone skilled in gaseous releases and design of hazard mitigation. The technical credibility of these measures is therefore subject to question as raised in discussion of the proposal at the public hearing. In addition, the analysis presented in support was based on dispersion of pure gaseous hydrogen, which is unique and disperses differently than hydrogen mixtures under the proposed definition of hydrogen under FG2-02. This definition, in fact, would include hydrogen mixtures that could be heavier than air, not lighter than air like pure gaseous hydrogen.

3.) It is unclear that ventilation requirements of Section 502.15 of the IMC are applicable to the mitigation of combustion hazards as applied in this section. Such systems should be required to use motors and other components the meet code-referenced ignition resistance requirements (e.g., Class 1, Division 2 of the National Electric Code). Section 502.15 does not stipulate these requirements.

AGA supports the development of sound code or standards coverage for hydrogen and hydrogen systems need to address deficiencies identified in the current proposals.

FG31-02
501.1.1

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Fairfax County, VA; representing VA Plumbing and Mechanical Inspectors Association/VA Building and Code Officials Association

Revise as follows:

505.1.1 (Supp) Commercial cooking appliances vented by exhaust hoods. Where commercial cooking appliances are vented by means of the Type I or Type II kitchen exhaust hood system that serves such appliances, the exhaust system shall be fan powered and the appliances shall be interlocked with the exhaust hood system to prevent appliance operation when the exhaust hood system is not operating. Where automatically operated appliances such as water heaters are vented through natural draft kitchen exhaust hoods, dampers shall not be installed in the exhaust system.

Exception: An interlock between the cooking appliance and the exhaust hood system shall not be required for appliances that are of the manually operated type and are factory-equipped with standing pilot burner ignition systems.

Proponent’s Reason: The revision to the main paragraph is to ensure that “natural draft” hood/exhaust systems will never be utilized to vent...
any fuel burning appliances. Natural draft hood systems are typically field fabricated and installed. They do not even come close to complying with any listing requirements for venting systems provided for in Chapter 5. Natural draft hood systems are designed to remove heat, steam and odors, not potentially hazardous flue gases. Natural draft hood systems are not 100 percent reliable for draft. For example, a hood system might not draft if located in a climate with comparatively warm outside temperatures. Furthermore and most importantly, this section is requiring appliances to interlock with hood systems. If there is no fan, with what are the appliances to interlock?

Section 501.2 requires that EVERY appliance discharge the products of combustion to the outdoors except those listed in Section 501.8. When you look in 501.8, there are absolutely no appliances that can come close to the hundreds of thousands of BTU’s that would be allowed to be unvented by this exception to 501.1.1. The code should not be making different rules for equipment because of the way the burners are ignited. Chapter 5 covers venting systems not ignition systems. Some comments to this proposal have been in reference to equipment being unsafe to re-light. The gas industry needs to address the removal of vapors from cooking operations, including grease, that are being released by the cooking equipment. The code should comply with any listing requirements for venting systems provided in the Mechanical Code. Unlike the conventional venting systems such as B-Vents, these hood systems require routine maintenance, including belt adjustments and hood/duct cleanings. This proposal will ensure everyone’s protection and enhance safety for a large industry, commercial restaurants. This is not a change from previous code provisions such as the 96 IMC Section 805.4.2 or the 2000 IFGC 503.2.1 and 503.3. This language is a new exception, which is a reduction and large step backwards for public safety, and was approved for the 2001 supplement with no supporting data. Instead of pretending that some type of data will somehow make a difference, please consider the committee’s comments and judge for yourself that this supporting reason addresses all their concerns, including the justification for the committee to do the right thing and approve this proposal.

Committee Action: Disapproved

Committee Reason: An interlock requirement for manually operated appliances could result in the field modification of listed appliances. A safety risk could be introduced by the interlock mechanism itself. The safety risk of an interlock mechanism outweighs the safety risk associated with utilizing the cooking appliances without the exhaust system in operation.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Guy Tomberlin, Fairfax County requests Approved as Submitted.

Commenter’s Reason: The idea that gas equipment need NOT be vented because of the method the burner is ignited is completely ridiculous and totally unrelated to the function of disposing of flue gases, which is the requirement this very section is written for. There has been no justification provided to demonstrate the safety for humans’ occupying the spaces where literally hundreds of thousands of BTU’s of gas burning equipment is operating without the assurance of positive venting? This is the scope of Chapter 5, to assure flue gases are removed from within the building and occupied spaces.

This technically unjustified exception is no exception, it is the rule. This type of equipment is what is most widely used and installed under commercial kitchen exhaust hoods. This is exactly the equipment this code section is written for and it should not to be exempted. The committee had received the requested data (provided by a nationally recognized testing laboratory) that showed what has been stated repeatedly, this type of equipment produces the exact same type of off gases as the type of equipment this code section requires to be interlocked.

FG35-02

611.1

Proposed Change as Submitted:

Proponent: Gary J. Potter, Sr., Cambridge Engineering; representing Working Group for Joint Z83/CSA Heavy Duty Heater Subcommittee

Add new text as follows:

SECTION 611 (IFGC)
DIRECT-FIRED INDUSTRIAL AIR HEATERS

RECIRCULATING DIRECT FIRED INDUSTRIAL AIR HEATERS

1. Revise as follows:

611.1.1 General. Recirculating direct-fired industrial air heaters shall be tested in accordance with listed to ANSI.
611.2 Location. Recirculating direct-fired industrial air heaters shall be installed only in industrial and commercial occupancies. Recirculating direct-fired air heaters shall be installed in any area intended for sleeping or serve any area containing sleeping quarters. Recirculating direct-fired industrial air heaters shall not be installed in hazardous locations where room air is recirculated across the burner, or which contain substances that are made toxic by exposure to fire or in buildings that contain flammable solids, liquids or gases, explosive materials, or substances that can become toxic when exposed to flame or heat.

611.3 Ventilation air. Direct-fired industrial air heaters shall be permitted to be installed in accordance with their listing and the manufacturer's instructions. Direct-fired industrial air heaters shall be installed only in industrial or commercial occupancies. Direct-fired industrial air heaters shall be permitted to provide fresh air ventilation. Only the amount of outdoor air that exceeds the minimum outdoor ventilation air required to maintain the contamination levels created by the heater in the space being served by the heater below 25 ppm for carbon monoxide, 3 ppm for nitrogen dioxide and 5000 ppm for carbon dioxide shall be considered as ventilation air. Where additional ventilation air is required to dilute the contaminants created by gas-fueled fork trucks or other unvented fossil-fueled equipment or appliances in buildings served by a recirculating Direct-Fired industrial air heater, the ventilation air shall be addressed separately.

611.4 Clearance from combustible materials. Recirculating direct-fired industrial air heaters shall be installed with a clearance from combustible material of not less than that shown on the label and in the manufacturers' instructions.

611.5 Air supply. Ventilation air to the recirculating direct-fired industrial air heater shall be ducted directly from the outdoors. Air to the recirculating direct-fired industrial air heaters that is in excess of the minimum ventilation air specified on the heater’s rating plate shall be taken from the building, ducted directly from outdoors, or a combination of both. Direct-fired industrial air heaters shall incorporate a means to supply outside ventilation air to the space at a rate of not less than 4 cfm per 1,000 Btu per hour (0.36 m³ per min per kw) of rated input of the heater. If a separate means is used to supply ventilation air, an interlock shall be provided so as to lock out the main burner operation until the mechanical means is verified. If outside air dampers or closing louvers are used, they shall be verified to be in the open position prior to main burner operation.

611.6 Atmospheric vents or gas reliefs or bleeds. Recirculating direct-fired industrial air heaters with valve train components equipped with atmospheric vents gas reliefs or bleeds shall have their atmospheric vent lines and gas reliefs or bleeds lead to the outdoors.

Means shall be employed on these lines to prevent water from entering and to prevent blockage by insects and foreign matter. An atmospheric vent line shall not be required to be provided on a valve train component equipped with a listed vent limiter.

611.7 Relief opening. The design of the installation shall include adequate provision to permit the recirculating direct-fired industrial air heaters to operate at rated capacity without over-pressurizing the space served by the heaters by taking into account the structure’s designed infiltration rate, providing properly designed relief openings or an interlocked power exhaust system, or a combination of these methods. The structure’s designed infiltration rate and the size of relief openings shall be determined by approved engineering methods. Relief openings shall be permitted to be louvers or counterbalanced gravity dampers. Motorized dampers or closable louvers shall be permitted to be used, provided they are verified to be in their full open position prior to main burner operation.

2. Add new text as follows:

611.8 Access. Recirculating direct-fired industrial air heaters shall be provided with access for removal of burners; replacement of motors, controls, filters, and other working parts; and for adjustment and lubrication of parts requiring maintenance.

611.9 Purging. Inlet ducting, where used, shall be purged by not less than four air changes prior to an ignition attempt.

Proponent's Reason: As part of the harmonization effort between Canada and the United States, five existing standards (ANSI Z83.4 for Direct Gas-Fired Make-Up Air Heaters, ANSI Z83.17 for Direct Gas-Fired Door Heaters, ANSI Z83.18 for Direct Gas-Fired Industrial Air Heaters, CAN1-3.7 for Non-Recirculating Direct Gas-Fired Make-Up Air Heaters, and CAN1-3.12 for Direct Gas-Fired Door Heaters) were combined into two standards (ANSI Z83.4/CSA-3.7 for Non-Recirculating Direct Gas-Fired Industrial Air Heaters and ANSI Z83.18 for Recirculating Direct Gas Fired Industrial Air Heaters). Since Canada did not permit installation of recirculating type heaters, the standard for recirculating heaters was submitted as an U.S. only standard.

In June of 2000, ANSI adopted the Standard for Recirculating Direct Gas-Fired Industrial Air Heaters. The certifying agencies have established an effective date of January 1, 2002 for all manufacturers of these appliances to have their heaters re-certified to the new standards. Heaters which have been certified to the previous standards will not be permitted to continued to utilize the certification label after the effective date.

Section 611.2 was expanded to match the instruction required by the standard (ANSI Z83.18).

During the development of these standards, it was determined that the long standing and established ventilation rate for heaters which
recirculate room air (4 cfm per 100 Bth/hr and as shown in the existing provision of 611.5) was technically flawed and that the primary relationship with respect to the potential buildup of combustion products in the space is tied the percentage of outside ventilation air supplied to dilute the combustion products generated by the heater. The restrictions place on what can be considered as ventilation air for the facility in Section 611.3 follows this logic and informs the users of this code that ventilation air for other requirements must be addressed separately. This finding also impacts the deletion of the ventilation criteria of Section 611.5

Section 611.8 and 611.9 were added to provide additional awareness to the installer of requirements of the installation.

Staff Analysis: The proposed revision to current Section 611.2 restricts the location of such heaters based on the presence of flammable solids, liquids and gases. Without quantity thresholds, the presence of any quantity of a flammable substance in a building would be cause to prohibit the installation of the heater.

The proposed revision to Section 611.7 refers to “over-pressurization” without providing criteria for space pressure.

Committee Action: Approved as Submitted

Committee Reason: Based on proponent’s published reason.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

James Ranfone, American Gas Association, requests Approved as Modified by this comment.

Modify proposal as follows:

SECTION 611 (IFGC)

RECYCLATING DIRECT FIRED INDUSTRIAL AIR HEATERS

611.1 General. Recirculating direct-fired industrial air heaters shall be listed to ANSI Z83.18 and shall be installed in accordance with the manufacturer’s installation instructions.

611.2 Location. Recirculating direct-fired industrial air heaters shall be installed only in industrial and commercial occupancies. Recirculating direct-fired air heaters shall not serve any area containing sleeping quarters. Recirculating direct-fired industrial air heaters shall not be installed in hazardous locations or in buildings that contain flammable solids, liquids or gases, explosive materials, or substances that can become toxic when exposed to flame or heat.

611.3 Ventilation air—Installation. Direct-fired industrial air heaters shall be permitted to be installed in accordance with their listing and the manufacturer’s instructions. Direct-fired industrial air heaters shall be installed only in industrial or commercial occupancies. Recirculating direct-fired industrial air heaters shall be installed in accordance with the manufacturer’s instructions. Direct-fired industrial air heaters shall be installed only in industrial or commercial occupancies. Recirculating direct-fired industrial air heaters shall be permitted to be installed in accordance with their listing and the manufacturer’s instructions. Direct-fired industrial air heaters shall be installed only in industrial or commercial occupancies. Recirculating direct-fired industrial air heaters shall be permitted to provide fresh air ventilation. Only the amount of outdoor air that exceeds the minimum outdoor ventilation air required to maintain the contamination levels created by the heater in the space being served by the heater below 25 ppm for carbon monoxide, 3 ppm for nitrogen dioxide and 500 ppm for carbon dioxide shall be considered as ventilation air. Where additional ventilation air is required to dilute the contaminants created by gas-fueled fork trucks or other unvented fossil-fueled equipment or appliances in buildings served by a recirculating Direct-Fired industrial air heater, the ventilation air shall be addressed separately.

611.4 Clearance from combustible materials. Recirculating Direct-fired industrial air heaters shall be installed with a clearance from combustible material of not less than that shown on the label and in the manufacturer’s instructions.

611.5 Air supply. Ventilation air to the recirculating direct-fired industrial air heater shall be ducted directly from the outdoors. Air to the recirculating direct-fired industrial air heaters that is in excess of the minimum ventilation air specified on the heater’s rating plate shall be taken from the building, ducted directly from outdoors, or a combination of both. Direct-fired industrial air heaters shall incorporate a means to supply outside ventilation air to the space at a rate of not less than 4 cfm per 1,000 Btu per hour (0.38 m<sup>3</sup> per min per kw) of rated input of the heater. If a separate means is used to supply ventilation air, an interlock shall be provided so as to lock out the main burner operation until the mechanical means is verified. Where outside air dampers or closing louvers are used, they shall be verified to be in the open position prior to main burner operation.

611.6 Atmospheric vents or gas reliefs or bleeds. Recirculating Direct-fired industrial air heaters with valve train components equipped with atmospheric vents gas reliefs or bleeds shall have their atmospheric vent lines and gas reliefs or bleeds lead to the outdoors. Means shall be employed on these lines to prevent water from entering and to prevent blockage by insects and foreign matter. An atmospheric vent line shall not be required to be provided on a valve train component equipped with a listed vent limiter.

611.7 Relief opening. The design of the installation shall include adequate provision to permit the recirculating direct-fired industrial air heaters to operate at rated capacity without over-pressurizing the space served by the heaters by taking into account the structure’s designed infiltration rate, providing properly designed relief openings or an interlocked power exhaust system, or a combination of these methods. The structure’s designed infiltration rate and the size of relief openings shall be determined by approved engineering methods. Relief openings shall be permitted to be louvers or counterbalanced gravity dampers. Motorized dampers or closable louvers shall be permitted to be used, provided they are verified to be in their full open position prior to main burner operation.

611.8 Access. Recirculating direct-fired industrial air heaters shall be provided with access for removal of burners; replacement of motors, controls, filters, and other working parts; and for adjustment and lubrication of parts requiring maintenance.

611.9 Purging. Inlet ducting, where used, shall be purged by not less than four air changes prior to an ignition attempt.

Commenter’s Reason: After further review, many of the new requirement being proposed in Sections 611.3 through 611.9 are unenforceable since they would require extensive field testing that would be more appropriate for engineered systems then for a product that is required to be listed to an American National Standard. Statements such as “Where additional ventilation air is required to dilute the contaminants created by gas-fueled fork trucks or other unvented fossil-fueled equipment or appliances in buildings served by a recirculating Direct-Fired industrial air heater, the ventilation air shall be addressed separately” (last line of proposed changes to Section 611.3) are subjective and not readily enforceable in the field. The term “over-pressurizing” is introduced in Section 611.7 without any definition of the criteria for determining “over-pressurizing”.

FG40-02

632.1

Proposed Change as Submitted:

Proponent: Kelvin Hecht, International Fuel Cells;
representing US Fuel Cell Council

Revise as follows:

632.1 General. Stationary fuel cell power plants having a power output not exceeding 1,000 kW shall be tested in accordance with ANSI Z21.83 and shall be installed in accordance with the manufacturer’s installation instructions and NFPA 853.

Proponent’s Reason: The reference to 1,000 kW is added for consistency with Section 924.1 of the International Mechanical Code, and the scope of Z21.83. The reference to NFPA 853 is added for completeness. NFPA 853 Standard for the Installation of Stationary Fuel Cell Power Plants, was approved as an American National Standard on August 18, 2000.

Committee Action: Approved as Modified

632.1 General. Stationary fuel cell power plants having a power output not exceeding 1,000 kW shall be tested in accordance with ANSI Z21.83 and shall be installed in accordance with the manufacturer’s installation instructions and NFPA 853.

Committee Reason: Based on proponent’s published reason. The modification deletes the reference to NFPA 853 because the standard was not provided to the committee or staff for review.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kelvin Hecht, US Fuel Cell Council, requests Approved as Submitted.

Commenter’s Reason: This proposal was modified by the committee because NFPA 853 was not submitted due to an oversight. It is attached. This proposal references current existing standards. Note: Both ANSI Z21.83 are undergoing revisions. Z21.83 will be reissued as CSA FC-1 and its scope will be broadened. The 2003 edition of NFPA 853 will address power plants below 50 kw. I will submit proposals to address these changes in the next ICC cycle.

Staff Analysis: NFPA 853, has been reviewed by staff and it is staff’s opinion that the standard complies with the ICC policy on referenced standards.

FG41-02

Chapter 7

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Chair, ICC Ad Hoc Committee for Hydrogen Gas

1. Add new text as follows:

SECTION 202 (IFGC)
GENERAL DEFINITIONS

HYDROGEN CUT-OFF ROOM. A room or space which is intended exclusively to house a gaseous hydrogen system.

HYDROGEN GENERATING APPLIANCE. A self-contained package or factory-matched packages of integrated systems for generating gaseous hydrogen. Hydrogen generating appliances utilize electrolysis, reformation, chemical, or other processes to generate hydrogen.

SECTION 416 (IFGC)
GASEOUS HYDROGEN SYSTEMS

401.1.2 General. The installation of gaseous hydrogen systems shall be in accordance with Chapter 7 and the International Fire Code.

CHAPTER 7
GASEOUS HYDROGEN SYSTEMS

SECTION 701 (IFGC)
GENERAL

701.1 Scope. The installation of gaseous hydrogen systems shall comply with this chapter and Chapters 30 and 35 of the International Fire Code. Compressed gases shall also comply with Chapter 27 of the International Fire Code for general requirements. Containers provided with pyrophoric material shall also comply with Chapter 41 of the International Fire Code. Containers having residual gaseous hydrogen shall be considered as full for the purposes of the controls required.

701.2 Permits. Permits shall be required as set forth in Section 106 and as required by the International Fire Code.

SECTION 702 (IFGC)
GENERAL REQUIREMENTS

702.1 Containers, cylinders and tanks. Compressed gas containers, cylinders and tanks shall comply with Chapters 30 and 35 of the International Fire Code.

702.1.1 Limitations for indoor storage and use. Flammable gas cylinders in occupancies regulated by the International Residential Code shall not exceed 250 cubic feet at Normal Temperature and Pressure (NTP).

702.1.2 Design and construction. Compressed gas containers, cylinders and tanks shall be designed, constructed and tested in accordance with the Chapter

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702.2 Pressure relief devices. Pressure relief devices shall be provided in accordance with Sections 702.2.1 through 702.2.7. Pressure relief devices shall be sized and selected in accordance with CGA S-1.1, CGA S-1.2 and CGA S-1.3.

702.2.1 Valves between pressure relief devices and containers. Valves including shutoffs, check valves and other mechanical restrictions shall not be installed between the pressure relief device and container being protected by the relief device.

Exception: A locked-open shutoff valve on containers equipped with multiple pressure-relief device installations where the arrangement of the valves provides the full required flow through the minimum number of required relief devices at all times.

702.2.2 Installation. Valves and other mechanical restrictions shall not be located between the pressure relief device and the point of release to the atmosphere.

702.2.3 Containers. Containers shall be provided with pressure relief devices in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, DOTn and Section 702.2.7.

702.2.4 Vessels other than containers. Vessels other than containers shall be protected with pressure relief devices in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, or DOTn.

702.2.5 Sizing. Pressure relief devices shall be sized in accordance with the specifications to which the container was fabricated. The relief device shall be sized to prevent the maximum design pressure of the container or system from being exceeded.

702.2.6 Protection. Pressure relief devices and any associated vent piping shall be designed, installed and located so that their operation will not be affected by water or other debris accumulating inside the vent or obstructing the vent.

702.2.7 Access. Pressure relief devices shall be located such that they are provided with ready access for inspection and repair.

702.2.8 Configuration. Pressure relief devices shall be arranged to discharge unobstructed in accordance with Section 2209 of the International Fire Code. Discharge shall be directed to the outdoors in such a manner as to prevent impingement of escaping gas on personnel, containers, equipment and adjacent structures and to prevent introduction of escaping gas into enclosed spaces. The discharge shall not terminate, under eaves or canopies.

Exception: This section shall not apply to DOTn-specified containers with an internal volume of 2 cubic feet (0.057 m3) or less.

702.3 Venting. Relief device vents shall be terminated to an approved location in accordance with Section 2209 of the International Fire Code.

702.4 Security. Compressed gas containers, cylinders, tanks and systems shall be secured against accidental dislodgement in accordance with Chapter 30 of the International Fire Code.

702.5 Electrical wiring and equipment. Electrical wiring and equipment shall comply with the ICC Electrical Code.

SECTION 703 (IFGC)
USE AND HANDLING

703.1 Applicability. Use and handling of containers, cylinders, tanks and hydrogen gas systems shall comply with this section. Gaseous hydrogen systems, equipment and machinery shall be listed or approved.

703.1.1 Controls. Compressed gas system controls shall be designed to prevent materials from entering or leaving process or reaction systems at other than the intended time, rate or path. Automatic controls shall be designed to be fail safe in accordance with accepted engineering practice.

703.1.2 Piping systems. Piping, tubing, valves and fittings conveying gaseous hydrogen shall be designed and installed in accordance with ASME B31.3, Sections 703.1.2.1 through 703.1.2.5 and Chapter 27 of the International Fire Code. Cast-iron pipe, valves and fittings shall not be used.

703.1.2.1 Sizing. Gaseous hydrogen piping shall be sized in accordance with approved engineering methods.

703.1.2.2 Design and construction. Piping systems shall be suitable for hydrogen service and the use intended through the full range of pressure and temperature to which they will be subjected. Piping systems shall be designed and constructed to provide allowance for expansion, contraction, vibration, settlement and fire exposure.

703.1.2.2.1 Prohibited locations. Piping shall not be installed in or through a circulating air duct, clothes chute, chimney or gas vent, ventilating duct, dumbwaiter, or elevator shaft.

703.1.2.2.2 Piping in solid partitions and walls.
Concealed piping shall not be located in solid partitions and solid walls, unless installed in a ventilated chase or casing.

**703.1.2.2.8 Settlement.** Piping passing through interior concrete or masonry walls shall be protected against differential settlement.

**703.1.2.3 Joints.** Joints on piping and tubing shall be listed for hydrogen service, inclusive of welded, brazed, flared, socket, slip or compression fittings. Gaskets and sealants shall be listed for hydrogen service. Threaded or flanged connections shall not be used in areas other than hydrogen cut-off rooms or outdoors.

**703.1.2.4 Valves and piping components.** Valves, regulators and piping components shall be listed for hydrogen service, shall be provided with access, and shall be designed and constructed to withstand the maximum pressure to which they will be subjected.

**703.1.2.4.1 Shutoff valves on storage containers and tanks.** Shutoff valves shall be provided on all storage container and tank connections except for pressure relief devices. Shutoff valves shall be provided with ready access.

**703.1.2.5 Testing.** Testing for physical integrity shall be performed at not less than 150 percent of the maximum allowable working pressure, or in accordance with the requirements of ASME B31.3.

**703.1.2.6 Piping in solid floors.** Piping in solid floors shall be laid in channels in the floor and covered in a manner that will allow access to the piping with a minimum amount of damage to the building. Where such piping is subject to exposure to excessive moisture or corrosive substances, the piping shall be protected in an approved manner. As an alternative to installation in channels, the piping shall be installed in a casing of schedule 40 steel, wrought iron, PVC or ABS pipe with tightly sealed ends and joints and ventilated to the outdoors. Both ends of such casing shall extend not less than 7 inches (51 mm) beyond the point where the pipe emerges from the floor.

**703.1.2.2.7 Piping outdoors.** Piping installed aboveground outdoors shall be securely supported and located where it will be protected from physical damage. Piping passing through an exterior wall of a building, shall be encased in a protective pipe sleeve. The annular space between the piping and the sleeve shall be sealed from the inside such that the sleeve is ventilated to the outdoors. Where passing through an exterior wall of a building, the piping shall also be protected against corrosion by coating or wrapping with an inert material. Below-ground piping shall be protected against corrosion.

**Exceptions:**
1. Tubing joined by brazing.
2. Fittings listed for use in concealed locations.

**703.1.2.4 Piping through foundation wall.** Underground piping shall not penetrate the outer foundation or basement wall of a building.

**703.1.2.5 Protection against physical damage.** In concealed locations, where piping other than stainless steel piping, stainless steel tubing, or black steel is installed through holes or notches in wood studs, joists, rafters or similar members less than 1 inch (25.4 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Shield plates shall be a minimum of 1/16-inch-thick (1.6 mm) steel, shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.

**703.1.2.6 Piping in solid floors.** Piping in solid floors shall be laid in channels in the floor and covered in a manner that will allow access to the piping with a minimum amount of damage to the building. Where such piping is subject to exposure to excessive moisture or corrosive substances, the piping shall be protected in an approved manner. As an alternative to installation in channels, the piping shall be installed in a casing of schedule 40 steel, wrought iron, PVC or ABS pipe with tightly sealed ends and joints and ventilated to the outdoors. Both ends of such casing shall extend not less than 7 inches (51 mm) beyond the point where the pipe emerges from the floor.

**703.1.2.7 Piping outdoors.** Piping installed aboveground outdoors shall be securely supported and located where it will be protected from physical damage. Piping passing through an exterior wall of a building, shall be encased in a protective pipe sleeve. The annular space between the piping and the sleeve shall be sealed from the inside such that the sleeve is ventilated to the outdoors. Where passing through an exterior wall of a building, the piping shall also be protected against corrosion by coating or wrapping with an inert material. Below-ground piping shall be protected against corrosion.

**Exceptions:**
1. Dispensing equipment need not be separated from canopies that are constructed in accordance with the International Building Code and in a manner that prevents the accumulation of hydrogen gas.
2. Gaseous hydrogen systems located in a separate...
building designed and constructed in accordance with the International Building Code and NFPA 50A.

3. Gaseous hydrogen systems located inside a building in a hydrogen cut-off room designed and constructed in accordance with Section 704.3 and the International Building Code.

4. Gaseous hydrogen systems located inside a building not in a hydrogen cut-off room where the gaseous hydrogen system is listed and labeled for indoor installation and installed in accordance with the manufacturer’s installation instructions.

5. Gaseous hydrogen systems installed in vaults constructed in accordance with the applicable requirements of Chapter 34 of the International Fire Code. Such locations shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in Chapter 5 of the International Mechanical Code.

6. Stationary fuel cell power plants in accordance with Section 623.0.

704.2 Location on property. Gaseous hydrogen systems shall be located in accordance with Chapter 22 of the International Fire Code.

704.3 Hydrogen cut-off rooms. Hydrogen cut-off rooms shall be designed and constructed in accordance with Sections 704.3.1 through 704.3.8 and the International Building Code.

704.3.1 Design and construction. Interior building openings shall be equipped with self-closing devices. Interior openings shall be electronically interlocked with the gaseous hydrogen system to prevent operation of the system when such openings are ajar or the room shall be provided with a mechanical exhaust ventilation system designed with a capture velocity at the opening of not less than 60 fpm. Operable windows are prohibited in interior walls.

704.3.2 Ventilation. Cut-off rooms shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in Chapter 5 of the International Mechanical Code.

Exception: This section shall not apply to rooms provided with ventilation systems meeting the requirements of Section 704.3.1.

704.3.3 Gas detection system. Hydrogen cut-off rooms shall be provided with an approved flammable gas detection system in accordance with Sections 704.3.3.1 through 704.3.3.3.

704.3.3.1 System design. The flammable gas detection system shall be listed for use with hydrogen and any other flammable gases used in the room. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammability limit (LFL) for the gas or mixtures present at anticipated temperature and pressure.

704.3.3.2 Operation. Activation of the gas detection system shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals both inside and outside the cut-off room.

2. Activation of the mechanical ventilation system.

704.3.3.3 Failure of the gas detection system. Failure of the gas detection system shall result in, activation of the mechanical ventilation system, cessation of hydrogen generation, and a trouble signal to sound in an approved location.

704.3.4 Ignition source control. Open flames, flame-producing devices and other sources of ignition shall be controlled in accordance with Chapter 35 of the International Fire Code.

704.3.5 Explosion control. Explosion control shall be provided in accordance with Chapter 9 of the International Fire Code.

704.3.6 Standby power. Mechanical ventilation and gas detection systems shall be connected to a standby power system in accordance with Chapter 27 of the International Fire Code.

704.3.7 Smoking. Smoking shall be prohibited in hydrogen cut-off rooms. “No Smoking” signs shall be provided at all entrances to hydrogen cut-off rooms.

704.3.8 Housekeeping. The hydrogen cut-off room shall be kept free from combustible debris and storage at all times.

SECTION 705 (IFGC)
OPERATION AND MAINTENANCE OF GASEOUS HYDROGEN SYSTEMS

705.1 Maintenance. Gaseous hydrogen systems and detection devices shall be maintained in accordance with the International Fire Code and the manufacturers’ installation instructions.

705.2 Purging. Purging of gaseous hydrogen systems shall be in accordance with Section 2210.8 of the International Fire Code.

2. IFC 3501.1 Scope. The storage and use of flammable gases shall be in accordance with this chapter. Compressed gases shall also comply with Chapter 30. Gaseous hydrogen systems at consumer sites shall also comply with NFPA 50A.

Exceptions:
In many cases the hydrogen fuel is utilized, with air, within a fuel cell to produce electricity and in some cases co-generate heat. Typically, building officials will be faced with two classes of equipment – those that generate hydrogen (for use by other devices) and those that utilize hydrogen as their energy input. In many cases, hydrogen will be utilized in a manner similar to the current use of natural gas. However, there are two important differences that cause the requirement to amend the ICC codes. First, both hydrogen and natural gas are lighter than air, but hydrogen is lighter than natural gas and is both more diffusive and more buoyant than natural gas. This means that in well-ventilated situations (e.g., outdoors) hydrogen will dissipate more quickly than natural gas, and much more quickly than either propane or gasoline, both of which have fumes that are heavier than air and will linger at an accident site. However, hydrogen and natural gas can both accumulate in unventilated pockets at the top of indoor structures and could represent a risk in such situations. Similarly, propane and gasoline fumes can accumulate at the floor level in unventilated spaces, posing a different risk. Thus ignition sources must be averted at the top of any unventilated spaces for hydrogen and natural gas, while ignitions sources must be precluded near the floor for gasoline or propane vehicles indoors. Second, hydrogen is odorless, colorless and burns with a flame that is not visible to the human eye. This means that it is unlikely that people will be able to detect unsafe conditions (without appropriate instrumentation) if they develop (similar to CO accumulation in a structure).

It is important that the ICC provide building officials with the necessary tools so that they can continue to ensure public safety as the public sector begins to adopt sources of hydrogen within the energy infrastructure. Therefore, the AHC has detailed a foundation for code requirements which will allow the safe handling and use of hydrogen as a fuel. Throughout their work, the AHC has sought consistency with existing codes and standards wherever possible. Where hydrogen standards in place today, do not cover the full scope of use or range of available or anticipated technologies, the AHC actively worked with a diverse group of technical and advisory parties from industry to establish criteria in the model codes to cover the installation and integration of these technologies with the building or facilities with which they are associated.

It is important to note that a given volume of natural gas has more than three times the energy of the same volume of hydrogen. Therefore, a given volume of pipe containing natural gas will contain the same energy (potential hazard) as a three times larger volume of hydrogen.

The revisions proposed in a related proposal to Section 101.2 along with the more specific requirements detailed in this proposal clearly define gaseous hydrogen within the scope of the International Fuel Gas Code (IFGC), and allow gaseous hydrogen to be stored and generated indoors not unlike natural gas, provided specific safeguards are implemented. All portions of the system are designed to be fail safe to provide adequate safety under “worst case” conditions.

Proposed Definitions to IFGC Section 202. HYDROGEN CUT-OFF ROOM. Section 202 currently does not define HYDROGEN CUT-OFF ROOM. The efforts of the International Code Council Ad Hoc Hydrogen (H2) Committee intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and hydrogen gas motor-vehicle fuel dispensing and generation stations. Accordingly, the H2 committee finds it necessary to prescribe requirements for hydrogen gas fuel dispensing and generation stations that are similar in format to existing International Fire Code provisions specific to “lighter-than air” fuels. The proposed language is needed to support the work of the H2 committee as it pertains to the hydrogen infrastructure (i.e., service stations, parking garages, loading areas, on-site generation and refueling applications and similar uses). This definition is derived from the IMC and NFPA 50A definition for SPECIAL ROOM, see §3-2.2.

HYDROGEN GENERATING APPLIANCE. Section 202 currently does not define HYDROGEN GENERATING APPLIANCE. The efforts of the International Code Council Ad Hoc Hydrogen (H2) Committee intend to address how future building codes can safely cover hydrogen applications. Most of the hydrogen now produced in the United States is on an industrial scale by the process of steam reforming, or as a byproduct of petroleum refining and chemicals production. However, there is growing interest in two different types of hydrogen generating appliances to produce hydrogen on-site at the

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1. Gases used as refrigerants in refrigeration systems (see Section 606).
2. Liquefied petroleum gases and natural gases regulated by Chapter 38.

3503.1.1 Limitations for indoor storage and use. Flammable gases shall not be stored or used in Group A, B, E, F, I, M, R or S occupancies.

Exceptions:
1. Cylinders not exceeding a capacity of 250 cubic feet (7.08 m³) each at NTP used for maintenance purposes, patient care or motor fuel dispensing and operation of equipment.
2. Food service operations in accordance with Section 3803.2.1.7.
3. Hydrogen motor fuel dispensing stations designed and constructed in accordance with Chapter 22.

3. IBC

### TABLE 302.1.1

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<th>ROOM OR AREA</th>
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Proponent’s Reason Item 1:

**Introduction.** Hydrogen energy safety is based on three primary elements: regulatory requirements, capability of safety technology and the systemic application of equipment and procedures to minimize risks. Groups involved in the industrial scale production of hydrogen (producers) currently implement many successful proprietary methodologies for safely generating and handling large amounts of hydrogen. Hydrogen users (e.g., NASA) depend on cryo-hydrogen as a fuel and have effectively proven the safety of large scale ground and vehicle systems which support the Space Shuttle Program.

The efforts of the International Code Council Ad Hoc Committee for Hydrogen Gas (AHC) intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and hydrogen gas motor-vehicle fuel dispensing and generation stations. The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes. This, and other, related proposals is a summation of their work.

**Related Revisions to IFGC Section 101.2—Scope.** The commercial products industry is moving toward the use of hydrogen in vehicles, generators and equipment to replace petroleum-based fuels in order to reduce atmospheric emissions and facilitate a shift to the use of renewable energy supplies. Furthermore, the commercialization of fuel cells, and the goal of sustainable development has propelled hydrogen supply technology to the forefront of clean energy applications for transportation and distributed and regenerative electric power.
customer’s refueling facility or even at a private residence from either electricity or from natural gas, propane or other fuels. Hydrogen Generating Appliances based on electrolyzers separate the elements of water – hydrogen and oxygen- by charging water with an electrical current. Adding hydrogen to cell electrolyte such as alkaline water benefits the efficiency of the water and increases the efficiency of the process. The electrical charge breaks the chemical bond between the hydrogen and oxygen and splits apart the atomic components. Hydrogen Generating Appliances based on chemical reformers separate out the hydrogen from fossil fuels such as natural gas, propane, gasoline, etc. This is the same high temperature chemical process used at large oil refineries to produce hydrogen. By generating the hydrogen on-site at the fueling station or customer’s facility, these Hydrogen Generating Appliances avoid the high cost of either liquefying hydrogen and delivering it by cryogenic tanker truck, or installing a national hydrogen pipeline system that could cost many tens of billions of dollars. In effect, these on-site Hydrogen Generating Appliances take advantage of one of two existing energy infrastructures: either the natural gas distribution system or the electrical grid.

IFGC Section 416. Wherever possible, requirements for hydrogen gas dispensing and generation stations that were similar to existing IFC content for “lighter-than-air” fuels were intentionally correlated or reproduced in context. The newly proposed language is necessary to support the work of the H2 committee as it pertains to the hydrogen infrastructure and to address new or emerging technology (now being contemplated by the automotive industry) that allows for storage of hydrogen generating Appliances based on chemical reformers separate out the hydrogen from fossil fuels such as natural gas, propane, gasoline, etc. This is the same high temperature chemical process used at large oil refineries to produce hydrogen. By generating the hydrogen on-site at the fueling station or customer’s facility, these Hydrogen Generating Appliances avoid the high cost of either liquefying hydrogen and delivering it by cryogenic tanker truck, or installing a national hydrogen pipeline system that could cost many tens of billions of dollars. In effect, these on-site Hydrogen Generating Appliances take advantage of one of two existing energy infrastructures: either the natural gas distribution system or the electrical grid.

IFGC Section 701.1. Chapters 30 and 35 of the IFC address the hazards of compressed hydrogen gas systems including stored hydrogen gas in pressure vessels. These referenced code provisions are intended to reduce the risk posed by the inadvertent rupture of a pressure vessel and its hydrogen gas component or the leakage of the flammable gas associated with a piping rupture. The AHC felt that a reference to the commensurate IFC provisions appropriately serve to limit the quantities of compressed hydrogen gas present on both commercial and residential sites, and considers indoor and outdoor use aspects adequately. Reference to Chapter 41 covering pyrophoric materials is intended to address emerging technology (now being contemplated by the automotive industry) that allows for storage of higher densities of compressed hydrogen gas in containers with relatively lower applied pressures.

The AHC feels it appropriate to work under the assumption that liquid hydrogen issues related to gaseous hydrogen production are to be covered by a new Chapter 8. Thus, the correlation with a proposed new Chapter 7 for gaseous hydrogen is intentional. Furthermore, since NFPA50A and NFPA50B do not scope all of the issues specific to self-sustained on-site generation and refueling applications and similar uses), for vehicle applications.

IFGC Section 702.1. It is not the intent of the AHC to directly or indirectly limit container, cylinder, tank size to no more than 250 scf per tank outside of residential occupancies. The purpose of the reference to Chapter 35 of the IFC is solely for container, cylinder, tank construction criteria and to ensure that bulk cylinders are not stored in residential occupancies. (See proposed revisions to IFC Section 3503.1.1)

IFGC Section 702.1.1. Addition of this language avoids elimination of Section 3501.1, Exception 3 of the IFC. The AHC feels this is a cleaner way to address bulk cylinder size in garages and detached structures associated with occupancies regulated by the IRC and their accessory structures. The IFC does not apply to occupancies regulated by the IRC and their accessory structures. None-the-less, elimination of the exception could be misinterpreted by subjecting occupancies regulated by the IRC to a number of requirements in the IFC that the committee does not necessarily feel are appropriate.

IFGC Section 702.1.2. Consistent with NFPA 50A. For the design and construction of compressed hydrogen gas containers, a pressure relief device to current IFC Section 2703.2.1 could be entertained here, but provides only general guidance (i.e., “in accordance with approved standards”). The structure of the proposed language is derived from IFC Section 3203.1.1. The AHC is not aware of any hydrogen containers meeting less than ASME VIII criteria. Provisions for alternative approval would address any nonstandard containers encountered.

The structure of proposed IFGC Section 702.2 and subsections was derived from current IFC Section 3203.2. Standard CGA S-1.1 does not yet cover relief devices on metal hydride containers. At this point the issue is gaseous hydrogen and the circumstances surrounding container failure. While preliminary, CGA is currently addressing issues of container performance at failure (as similar to a Boiling Liquid, Expanding Vapor Explosion, BLEVE), and the particulate matter that may potentially foul the pressure relief device. However, from the standpoint of the AHC a metal hydride container is considered a gaseous hydrogen source. It is the AHC’s intent that metal hydride containers be evaluated under provisions for alternative approval.

IFGC Section 702.2.1. The AHC’s intent here is to require a pressure relief device (PRD) providing protection from over-pressure without obstruction. The presumption is that the PRD is sized correctly.

IFGC Section 702.2.3. This section is consistent with NFPA 50A as it requires PRD’s only as dictated by the specifications to which the container was fabricated (i.e., ASME or DOTn).

IFGC Section 702.2.7. Regarding accessibility, the AHC did not intend to prohibit PRD’s integral to the container or vessel. It is implicit, however, that the container or vessel standard will address the issue of “integral” PRD’s].

IFGC Section 702.3. In developing provisions for the venting of hydrogen systems the AHC consulted with hydrogen producers, and their corresponding gas and equipment group—engineering safety departments. In general, four general hydrogen design considerations are included in the design of all hydrogen process vent piping: 1) Vent to a safe area, 2) Ignition likely, 3) Design for thermal radiation from flame, and 4) Design to prevent (un-ignited) flammable mixtures from reaching personnel areas and ignition sources. While these considerations are general in nature and intended for use by designers, fabricators, installer, users and maintainers of hydrogen piping systems, the AHC also sought consistency with existing codes and standards wherever possible and in the best interest to safety personnel, fire departments, code officials and other emergency personnel. This included a review of the Compressed Gas Association’s “Standard for Hydrogen Piping Systems at Consumer Locations,” CGA G-5.4. CGA G-5.4 specifies that piping systems should be designed in accordance with ASME B31.3, “Chemical Plant and Petroleum Refinery Piping.”

Also a consideration in the AHC’s work, is the most modern view of many members of the CGA S-1.1 Committee (CGA S-1.1 Pressure Relief Device Standards—Part 1—Cylinders for Compressed Gases) which will most likely be reflected in te next edition of CGS A-1.1., and that is: “The ‘engulfing fire case’ shall not be included in the approach to hydrogen safety.” Therefore, the AHC has adopted the intent that it is far more effective to mitigate the risk of an engulfing fire by diking, rather than address the concept of the maximum hypothetical accident directly. Typically the normal sizing of PRD’s for other demands (e.g., a runaway hydrogen compressor) is much smaller than the engulfing fire case, hence the height and distances criteria for the vent stack are easier to accommodate without truly sacrificing safety.

Regarding ventilation, proposed IFGC Section 702.4 requires mechanical exhaust consistent with the applicable provisions for repair garages in Chapter 5 of the International Mechanical Code. The exhaust flow rates specified therein must be provided at all times and interlocked to respond to fan failure or hydrogen detection. The goal of these provisions is to never permit the maximum concentration of flammable contaminants in air to exceed more than 25% of the LFL for hydrogen during the period that the credible leak exists. It should be made perfectly clear that the room or space shall be depressurized by means of exhaust rather than pressurized or otherwise diluted to achieve these levels.
The exception is specific to interior spaces harboring “Gaseous hydrogen systems.” That is, Section 704.2 does not apply to your typical hydrogen-fueled vehicle parked in a garage, with or without a vehicle fueling appliance located in the garage. Note however, that the same concepts apply to the building itself, but that no research work has been utilized as the basis for this natural alternative. (See reason to IFGC Section 305.2).

Regarding the security arrangements required by proposed IFGC Section 702.5: The structure of this language was derived from current IFC Section 3003.3. The intent is to require “nesting” or locking of cylinders or cylinder groups. Site-perimeter security could be viewed as an approved alternative.

IFGC Section 703.1.2. The ASME Boiler and Pressure Vessel Code (Section II) discusses issues related to hydrogen service but does not make specific material recommendations. The Source Book and the Safety Standard for Hydrogen and Hydrogen Systems (NASA, 1997) provide more specific guidelines. The following information is a reasonably conservative summary of these guidelines.

For metallic materials: Aluminum and its alloys, austenitic stainless steels with greater than 7% nickel (such as 304, 304L, 308, 316, 321, 347), copper and its alloys (such as brass, bronze, and copper nickel), and titanium and its alloys are generally satisfactory for hydrogen service. Care must be taken to not over-stress components in systems as some of these materials may lose ductility if stressed beyond yield. Nickel and nickels containing over 7% nickel can be used in gaseous hydrogen service at ambient temperature. Carbon steels, low alloy steels, chromium, molybdenum, niobium, and zinc are not acceptable for cryogenic temperatures. Grey, ductile or cast iron should not be used in hydrogen service (NFPA 50A).

For welds: Welding requirements are given in the ASME Boiler and Pressure Vessel Codes and ANSI/ASME B31.3. Care must be taken as welds of some of the acceptable materials (listed above) are susceptible to hydrogen embrittlement and/or cracking if not properly executed.

For non-metallic materials: Use of elastomers and plastics should be limited in gasketing, packing or other sealing elements where failure as a result of fire could cause hydrogen leakage. Valve seat materials should be the materials of standard industrial practice for gaseous hydrogen near room temperature. Teflon™ or Kel-F™ can be used in cold gaseous hydrogen or liquid hydrogen systems for valve seats (although Fluorogreem™ preferred), coatings on metallic O-rings, gaskets for tongue and groove flanges, or gland packing or seals (only if maintained near ambient temperature). Kel-F™ is preferred rather than Teflon™ for liquid hydrogen service as it has a higher tensile strength and is less brittle. All Teflon™ gaskets must be totally contained to prevent cold flow and subsequent leakage. Valves for liquid service over 2.1 MPa (300 psia) should use metal-to-metal seats. IFGC Section 703.1.2.5. Pressure testing in the ASME Boiler and Pressure Vessel Code may be either hydro or pneumatic. Hydro-tests a 150% of the rated allowable working pressure (MAWP) times a temperature correction factor. In some situations the hydrogen system contains catalysts or other materials which could be damaged by water, a pneumatic test is preferable to a hydro-test. This flexibility is therefore, intentional. A pneumatic test is typically conducted at 125% rather than 150% of the MAWP.

IFGC Section 704.1 defers to NFPA 50A for installation issues only, and in the absence of any exception, NFPA 50A does not outline requirements for establishments operated by a hydrogen supplier or the supplier’s agent for the purpose of storing hydrogen and refilling portable containers, trailers, vehicles, supply tanks or tank cars (i.e., These examples are not considered “Consumer Sites” as referenced by the Standard). However, while both NFPA 50A and the criteria proposed herein for the International Codes are both based on the hazards associated with specific quantities and types of materials at consumer sites, the circumstances addressed here by exception, ensure coverage for the full range of available or anticipated technologies. Moreover, the circumstances addressed by exception are inclusive of the forecasted use of gaseous hydrogen as a fuel, and the quantities stored such that the materials will not represent an undue risk to the area or to the building or facilities with which they are associated.

IFGC Section 704.2 defers to Chapter 22 of the International Fire Code (IFC) specifically for locating hydrogen systems on property (See AHC’s proposal and reason to Chapter 22 of the IFC). The IFC requirements are based on the hazards associated with the specific materials, e.g, compressed, flammable gas. These requirements are framed such that the location on the property is appropriate for use with this class of material, and will not represent an undue risk to personnel in the area or to the building or facilities with which they are associated.

IFGC Section 704.3. In the best interest of consistency, the AHC proposes to defer to the International Building Code for building construction requirements. The IBC requirements are based on the hazards associated with material-specific properties. For hydrogen, a flammable gas, there are specific requirements to ensure that the building is appropriate for use with this class of material. Sections 704.3.1 through 704.3.8 deal with fire safety provisions for use with hydrogen. Since the chapter associated with flammable gases in the International Fire Code exempts hydrogen systems which are regulated under the International Fuel Gas Code, these code sections are necessary in the IFGC to ensure the implementation of fire safety systems.

IFGC Section 704.3.1 intends to detail the design and construction criteria for the cut-off room. These requirements are loosely based on NFPA 50A requirements (Gaseous Hydrogen Systems at Consumer Sites) for “Special Rooms.” To allow for broader applications (such as emergency generators using fuel cell technology), interior wall openings are allowed for easy access to the systems. The hydrogen generation shall be terminated if an interior door is opened through its interlocks to prevent the venting of flammable gas to an area which is not properly ventilated. In applications where it is not appropriate for interlocks to be installed (i.e., emergency generators), significant ventilation is required to ensure that a flammable mixture is not attained within the room.

IFGC Section 704.3.2 intends to prevent a dangerous accumulation of flammable gas in the room through the use of an exhaust ventilation system. The Source-Book for Hydrogen Applications recommends ventilation at the rate of 1 CFM per square foot of floor area, which is relative to the requirements in Chapter 5 of the IMC. The exception in 704.3.2 is provided to allow exhaust systems which are designed with a capture velocity of 60 fpm at the door opening. This capture velocity exceeds the requirements found in Chapter 5 of the IMC. Since hydrogen is non-toxic, if a release can be kept below its flammable limit, there is minimal hazard. The ventilation requirements are designed to perform that function.

There are no requirements for gas detection in NFPA 50A. The AHC believes gas detection appropriate and integral to life safety. Therefore, IFGC Section 704.3.3 was derived from current IFC Section 2210.7.2, and intends to address the fact that early detection of the presence of a flammable gas will allow adequate safeguards to be taken. Hydrogen fires are not normally extinguished until the supply of hydrogen has been shut off because of the danger of re-ignition or explosion. A gas detection system in the room or space harboring a gaseous hydrogen system provides for early notification of a leak that is occurring before the escaping gas reaches hazardous exposure concentration levels. The required local alarm is intended to alert the occupant to an emergent condition in the vicinity. The monitor control equipment must also initiate operation of the mechanical ventilation system in the event of a leak or rupture in the gaseous hydrogen system to prevent an accumulation of flammable gas. Systems shall be designed to be “fail-safe” such that all safety systems shall be activated to alert any occupants that a problem exists and to prevent more hydrogen from being generated by any appliances in the room.

IFGC Section 704.3.4 is intended to prevent any flammable gas releases from finding ignition sources. These requirements are identified in the IFC in locations where flammable gases are stored or used. The requirements are consistent with NFPA 50A and the Sourcebook for Hydrogen Applications. The energy required for ignition of hydrogen-air mixtures is very small, and even分钟 effort must be made to control ignition sources until the area can be properly ventilated, thus removing the hazard.

IFGC Section 704.3.5 is intended to prevent a catastrophic failure of the cut-off room. It is the final safeguard in case other prevention methods fail (ventilation, alarms). An ignited hydrogen mixture produces large quantities of heat causing a rapid expansion of the surrounding air. This can cause a pressure increase in a confined space and a catastrophic failure. Explosion control methods are identified in the IFC to prevent such a catastrophic failure. The explosion control requirements for hydrogen are consistent with the
requirements in NFPA 50A, the IFC, and the Sourcebook for Hydrogen Applications.

IFGC Section 704.3.6 intends to ensure that safety systems remain active in the event of a power failure of the primary power supply. Hydrogen is a colorless, odorless gas and a release may go undetected if detection systems are not functioning. The accumulation of hydrogen in an unventilated area can lead to mixtures in the flammable range if safety systems mechanical ventilation systems are not in operation. Chapter 27 of the IFC addresses emergency and standby power requirements for emergency systems. It also allows an exception to the requirement for systems which are fail safe (see IFC Section 2704.7 Exception 4). This exception may be utilized in cut-off rooms where hydrogen is generated, but not stored. Any storage of hydrogen within the cut-off room would not qualify for the exception, because in the event of a power failure, there will be no way to detect or ventilate a release from a storage vessel.

IFGC Section 704.3.7 intends to augment the requirement in Section 704.3.4. The intent is the same as is in the ignition source control section.

IFGC Section 704.3.8 intends to protect the cut-off room from the storage of other materials which may ignite and cause an exposure fire in the room. Preclusion of combustible materials eliminates this hazard and protects the equipment and storage containers.

IFGC Section 705.1. This section refers to the IFC for maintenance of hydrogen systems. More specifically, Section 2703.2.6 of the IFC details required maintenance activities for hazardous materials storage and use. This includes maintenance of alarms, cylinders, ventilation systems and other devices needed to ensure safety of the gaseous hydrogen system. Failure to properly maintain any of these systems increases the likelihood of a hydrogen release and compromises the safety of the operation. This section is also consistent with the general maintenance provision of the IFC identified in Section 107.1.

In Summary. The AHC has developed these changes through the consultation of a diverse group of technical and advisory parties from various parties in the hydrogen community, inclusive of industry, professional associations, testing laboratories, agencies of government, academic and research institutions and believes it important to provide a template for thorough coverage in the International Codes of equipment, appliances and vehicles that will utilize hydrogen as a fuel such that regulators have a sound technical basis on which to verify installation and to uphold the standard of health and safety for the citizens of their jurisdictions.

Industry is ready to commercialize hydrogen energy systems. The AHC urges your APPROVAL of this proposal "as submitted".

Proponent’s Reason Item 2: The development of hydrogen fueled vehicles and equipment is a rapidly developing area. Making gaseous hydrogen available as motor vehicle fuel will likely require storage of that fuel gas in quantities beyond what is currently allowed by this section. In order to facilitate the continued technological developments, a safe means of handling and storage, the fuel must be manufactured some how. To address this, a new section of code is concurrently proposed to Chapter 22 of the IFC which addresses hydrogen gas refueling stations. It has specific details as to requirements for the safe storage, use and handling of the flammable gas. These details include vehicle protection, exposure set-backs, electrical area classifications and other pertinent requirements. Since specific code language is proposed for both the International Fuel Gas Code for systems using hydrogen as a fuel gas, and the International Fire Code addressing the hazards associated with the refueling stations, the AHC feels the more general language of Chapter 35 and the reference to NFPA 50a now need not apply.

Exception 3 to Section 3503.1.1 is necessary to enable commercial refueling stations designed for that purpose, but also to address remote storage and refueling operations affiliated with buildings designed and constructed in accordance with Section R102.7 of the IRC (i.e., One- and Two-Family Dwellings and Town homes).

Proponent’s Reason Item 3: HYDROGEN CUT-OFF ROOM. Revisions proposed to the IFGC intend to define both HYDROGEN CUT-OFF ROOM and HYDROGEN GENERATING APPLIANCES. The Ad Hoc Committee for Hydrogen Gas finds it necessary to prescribe requirements for the location of HYDROGEN GENERATING APPLIANCES in an around buildings that are similar in format to existing provisions specific to "lighter-than air" gases and fuels. The proposed language is needed to support the work of the AHC as it pertains to hydrogen infrastructure (i.e., service stations, parking garages, loading areas, on-site generation and refueling applications and similar uses). This definition is derived from the IMC and NFPA 50a definition for SPECIAL ROOM, see §3-2.2 of NFPA 50a.

ITEM 1 Committee Action: Disapproved

Committee Reason: Disapproval is consistent with the action taken on FG2-02, FG15-02 and FG48-02. The IFGC is not the appropriate location for hydrogen coverage. Such coverage belongs in the IFC or a separate code dedicated to hydrogen. The proposed text is not of the quality necessary for inclusion in an ICC code because of the numerous technical flaws, such as lack of coverage for something as fundamental as leak testing of piping.

Assembly Action: Approved as Submitted

ITEM 2 Committee Action: Approved as Submitted

Committee Reason: The IFC is the proper location for such coverage.

Assembly Action: No Motion

ITEM 3 Committee Action: Disapproved

Committee Reason: Cut-off rooms need to coordinate with the provisions of NFPA 50a. It is not clear what is being addressed in the proposed text relative to gaseous hydrogen systems.

Assembly Action: No Motion

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted and an assembly action was successful.

Public Comment 1:

Gilbert Gonzales, Murray City Corp., requests Approved as Submitted for Item 1 only.

Commenter’s Reason: The proposed text does not address every possible scenario nor is it a perfect document. However, as with any new technology the industry must have a reasonable and enforceable base from which to regulate the safe installation and delivery of hydrogen gas. The Ad Hoc Committee for Hydrogen Gas has made every conceivable attempt to provide the Fuel Gas Code Committee and the ICC membership with just that. The comment made in the committee reasoning that states the ad hoc committee had no members in tune with fuel gas issues is incorrect. The original proposal noted that “The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes.” The fact that hydrogen is a fuel gas, would make the Fuel Gas Code the logical choice for these requirements. To address the code requirements for hydrogen gas through a separate code is both unreasonable and impractical.

Public Comment 2:
Kevin H. Scott, Kern County Fire Department, requests Approved as Modified by this comment for Item 2 only.

Modify proposal as follows:

Part 2

IFC 3501.1 Scope. The storage and use of flammable gases shall be in accordance with this chapter. Compressed gases shall also comply with Chapter 30. Gaseous hydrogen systems at consumer sites shall also comply with NFPA 50A.

Exceptions:
1. Gases used as refrigerants in refrigeration systems (see Section 606).
2. Liquefied petroleum gases and natural gases regulated by Chapter 38.
4. Hydrogen motor fuel dispensing stations designed and constructed in accordance with Chapter 22.

IFC 3513.1.1 Limitations for indoor storage and use. Flammable gases shall not be stored or used in Group A, B, E, F, I, M, R or S occupancies.

Exceptions:
1. Cylinders not exceeding a capacity of 250 cubic feet (7.08 m3) each at NTP used for maintenance purposes, patient care or motor fuel dispensing and operation of the equipment.
2. Food service operation in accordance with Section 3803.2.1.7.
3. Hydrogen motor fuel dispensing stations designed and constructed in accordance with Chapter 22.

Commenter’s Reason: This comment is intended to relocate the exception for hydrogen motor fuel dispensing. The exception will still be allowed but will now be applicable to the entire Chapter because it will be in the scope. The change will retain the current text in Section 3501.1 and 3503.1.1, plus add a new exception to 3501.1.

Additionally, this comment will create a correlation between Item F167-02 which the Fire Code Committee approved. In the process of approving F167, the committee disallowed indoor dispensing. This is a new technology and should be proven first before it is allowed indoors, especially in A, E, I occupancies where there is a high potential for life loss or in B, M, or S occupancies where there is a high potential for property loss.

This comment acknowledges the hydrogen fuel technology, but refers the code user back to Sections 2209 and 2210 for the specific provisions for its use.

Public Comment 3:

ICC Ad Hoc Committee for Hydrogen Gas, requests Approved as Modified by this comment for Item 1 and Approved as Submitted for Item 2 and 3.

Modify proposal as follows:

Proponent: ICC Ad Hoc Committee for Hydrogen Gas

SECTION 416 (IFGC)

GASEOUS HYDROGEN SYSTEMS:

401.1.2 General. The installation of gaseous hydrogen systems shall be in accordance with Chapter 7 and the International Fire Code.

CHAPTER 7

GASEOUS HYDROGEN SYSTEMS

SECTION 701 (IFGC)
communicate with the outdoors horizontally, and have a minimum free area of \( \frac{1}{2} \) square foot per 1,000 cubic feet of garage volume.

703.1.2 Louvers and grilles. In calculating free area required by Section 703.1.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louver will have 25 percent free area and metal louver and grilles will have 75 percent free area. Louvers and grilles shall be fixed in the open position.

703.1.2 Mechanical ventilation. Indoor locations intended for hydrogen generating or refueling operations shall be ventilated in accordance with Section 502.15 of the International Mechanical Code.

703.1.3 Specially engineered installations. As an alternative to the provisions of Section 703.1.1 and 703.1.2 the necessary supply of air for ventilation and dilution of flammable gases shall be provided by an approved engineered system.

703.2 Containers, cylinders and tanks. Compressed gas containers, cylinders and tanks shall comply with Chapters 30 and 35 of the International Fire Code.

703.2.1 Limitations for indoor storage and use. Flammable gas cylinders in occupancies regulated by the International Residential Code shall not exceed 250 cubic feet at Normal Temperature and Pressure (NTP).

703.2.2 Design and construction. Compressed gas containers, cylinders and tanks shall be designed, constructed and tested in accordance with the Chapter 27 of the International Fire Code, ASME Boiler and Pressure Vessel Code (Section VIII) or DOT 49 CFR, Parts 100-180.

703.3 Pressure relief devices. Pressure relief devices shall be provided in accordance with Sections 703.3.1 through 703.3.8. Pressure relief devices shall be sized and selected in accordance with CGA S-1.1, CGA S-1.2 and CGA S-1.3.

703.3.1 Valves between pressure relief devices and containers. Valves including shutoffs, check valves and other mechanical restrictions shall not be installed between the pressure relief device and container being protected by the relief device.

Exception: A locked-open shutoff valve on containers equipped with multiple pressure-relief device installations where the arrangement of the valves provides the full required flow through the minimum number of required relief devices at all times.

703.3.2 Installation. Valves and other mechanical restrictions shall not be located between the pressure relief device and the point of release to the atmosphere.

703.3.3 Containers. Containers shall be provided with pressure relief devices in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, DOTn and Section 703.3.7.

703.3.4 Vessels other than containers. Vessels other than containers shall be protected with pressure relief devices in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, or DOTn.

703.3.5 Sizing. Pressure relief devices shall be sized in accordance with the specifications to which the container was fabricated. The relief device shall be sized to prevent the maximum design pressure of the container or system from being exceeded.

703.3.6 Protection. Pressure relief devices and any associated vent piping shall be designed, installed and located so that their operation will not be affected by water or other debris accumulating inside the vent or obstructing the vent.

704.1 Applicability. Use and handling of containers, cylinders, tanks and hydrogen gas systems shall comply with this section. Gaseous hydrogen systems, equipment and machinery shall be listed or approved.

704.1.1 Controls. Compressed gas system controls shall be designed to prevent materials from entering or leaving process or reaction systems at other than the intended time, rate or path. Automatic controls shall be designed to be fail safe in accordance with accepted engineering practice.

704.1.2 Piping systems. Piping, tubing, valves and fittings conveying gaseous hydrogen shall be designed and installed in accordance with ASME B31.3, Sections 704.1.2.1 through 704.1.2.5 and Chapter 27 of the International Fire Code. Cast-iron pipe, valves and fittings shall not be used.

704.1.2.1 Sizing. Gaseous hydrogen piping shall be sized in accordance with approved engineering methods.

704.1.2.2 Identification. Piping used to convey Gaseous Hydrogen shall be identified and marked, “HYDROGEN”, at intervals not exceeding 10 feet. Letters of such marking shall be in color other than the piping. Piping shall be identified a minimum of one time in each room or space through which it extends.

704.1.2.3 Piping design and construction. Piping systems shall be Type 304, Type 304L or Type 316 stainless steel tubing listed or approved suitable for hydrogen service and the use intended through the full range of pressure and temperature to which they will be subjected. Piping systems shall be designed and constructed to provide allowance for expansion, contraction, vibration, settlement and fire exposure.

704.1.2.4 Prohibited locations. Piping shall not be installed in or through a circulating air duct, clothes chute, chimney or gas vent, ventilating duct, dumbwaiter, or elevator shaft.

704.1.2.5 Piping in solid partitions and walls. Concealed piping shall not be located in solid partitions and solid walls, unless installed in a ventilated chase or casing.

704.1.2.6 Piping in concealed locations. Portions of a piping system installed in concealed locations shall not have unions, tubing fittings, right or left couplings, bushings, compression couplings and swing joints made by combinations of fittings.
Exceptions:
1. Tubing joined by brazing.
2. Fittings listed for use in concealed locations.

703.1.2.2.4 Piping through foundation wall. Underground piping shall not penetrate the outer foundation or basement wall of a building.

703.1.2.2.5 Protection against physical damage. In concealed locations, where piping other than stainless steel piping, stainless steel tubing, or black steel is installed through holes or notches in wood studs, joists, rafters or similar members less than 1 inch (25.4 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Shield plates shall be a minimum of 1/16-inch-thick (1.6 mm) steel, shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.

703.1.2.2.6 Piping in solid floors. Piping in solid floors shall be laid in channels in the floor and covered in a manner that will allow access to the piping with a minimum amount of damage to the building. Where such piping is subject to exposure to excessive moisture or corrosive substances, the piping shall be protected in an approved manner. As an alternative to installation in channels, the piping shall be installed in a casing of schedule 40 steel, wrought iron, PVC or ABS pipe with tightly sealed ends and joints and ventilated to the outdoors. Both ends of such casing shall extend not less than 2 inches (51 mm) beyond the point where the pipe emerges from the floor.

703.1.2.2.7 Piping outdoors. Piping installed aboveground outdoors shall be securely supported and located where it will be protected from physical damage. Piping passing through an exterior wall of a building, shall be encased in a protective pipe sleeve. The annular space between the piping and the sleeve shall be sealed from the inside such that the sleeve is ventilated to the outdoors. Where passing through an exterior wall of a building, the piping shall also be protected against corrosion by coating or wrapping with an inert material. Below-ground piping shall be protected against corrosion.

703.1.2.3.8 Settlement. Piping passing through interior concrete or masonry walls shall be protected against differential settlement.

703.1.2.4 Joints. Joints on piping and tubing shall be listed for hydrogen service, inclusive of welded, brazed, flared, socket, slip or compression fittings. Gaskets and sealants shall be listed for hydrogen service. Threaded or flanged connections shall not be used in areas other than hydrogen cut-off rooms or outdoors.

703.1.2.5 Valves and piping components. Valves, regulators and piping components shall be listed or approved for hydrogen service, shall be provided with access, and shall be designed and constructed to withstand the maximum pressure to which they will be subjected.

703.1.2.5.1 Shutoff valves on storage containers and tanks. Shutoff valves shall be provided on all storage container and tank connections except for pressure relief devices. Shutoff valves shall be provided with ready access.

703.1.2.5 Testing. Testing for physical integrity shall be performed at not less than 150 percent of the maximum allowable working pressure, or in accordance with the requirements of ASME B31.3.

703.2 Upright use. Compressed gas containers, cylinders and tanks, except those with a water volume less than 1.3 gallons (5 L) and those designed for use in a horizontal position, shall be used in an upright position with the valve end up. An upright position shall include conditions where the container, cylinder or tank, axis is inclined as much as 45 degrees (0.80 rad) from the vertical.

704.3 Material-specific regulations. In addition to the requirements of this section, indoor and outdoor use of hydrogen compressed gas shall comply with the material-specific provisions of Chapters 30 and 35 of the International Fire Code.

704.4 Handling. The handling of compressed gas containers, cylinders and tanks shall comply with Chapter 27 of the International Fire Code.

SECTION 705 (IFGC) TESTING OF HYDROGEN PIPING SYSTEMS

705.1 General. Prior to acceptance and initial operation, all piping installations shall be inspected and pressure tested to determine that the materials, design fabrication, and installation practices comply with the requirements of this code.

705.2 Inspections. Inspection shall consist of a visual examination of the entire piping system installation and a pressure test, prior to system operation. Engineered systems shall be designed using approved engineering methods, utilize the inspection procedures of ASME B31.3, and such inspections shall be verified by the code official.

705.3 Pressure test. The test pressure to be used shall be not less than 1 1/2 times the proposed maximum working pressure, but not less than 5 psig, irrespective of the design pressure. Where the test pressure exceeds 125 psig, the test pressure shall not exceed a value that produces hoop stress in the piping greater than 50% of the specified minimum yield strength of the pipe. Testing of engineered systems shall utilize the testing procedures of ASME B31.3 provided that test duration and gauge accuracy are included in the procedures as specified in 703.1.1 and 703.2.

705.3.1 Test duration. The test duration shall not be less than 1/2 hour for each 500 cubic feet of pipe volume. For piping systems having a volume of more than 24,000 cubic feet, the duration of test shall not be required to exceed 24 hours.

705.3.2 Test gauges. Test gauges used for testing shall be as follows:

1. Test requiring a pressure of 10 psi or less shall utilize a testing gauge having increments of 0.10 psi or less.
2. Test requiring a pressure of greater than 10 psi but less than or equal to 100 psi shall utilize a testing gauge having increments of 1 psi or less.
3. Test requiring a pressure test greater than 100 psi shall utilize a testing gauge having increments of 2 psi or less.

Exception: Measuring devices shall be permitted having equivalent level of accuracy as listed above, when approved by the design engineer and the code official.

705.4 Detection of leaks and defects. The piping system shall withstand the test pressure specified without showing any evidence of leakage or other defects.

705.4.1 Corrections. Where leakage or other defects are located, the affected portion of the piping system shall be repaired and retested.

SECTION 706 (IFGC) LOCATION OF GASEOUS HYDROGEN SYSTEMS

706.1 General. This section shall govern the location, and installation of gaseous hydrogen systems.

Exceptions:
1. Dispensing equipment need not be separated from canopies that are constructed in accordance with the International Building Code and in a manner that prevents the accumulation of hydrogen gas.
2. Gaseous hydrogen systems located in a separate building designed and constructed in accordance with the International Building Code and NFPA 50A.
3. Gaseous hydrogen systems located inside a building in a hydrogen cut-off room designed and constructed in accordance with Section 706.3 and the International Building Code.

4. Gaseous hydrogen systems located inside a building not in a hydrogen cut-off room where the gaseous hydrogen system is listed and labeled for indoor installation and installed in accordance with the manufacturer's installation instructions.

5. Gaseous hydrogen systems installed in vaults constructed in accordance with the applicable requirements of Chapter 34 of the International Fire Code. Such locations shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in Chapter 5 of the International Mechanical Code.

6. Stationary fuel cell power plants in accordance with Section 623.0.

704.2 706.2 Location on property. Gaseous hydrogen systems shall be located in accordance with Chapter 22 of the International Fire Code.

704.3 706.3 Hydrogen cut-off rooms. Hydrogen cut-off rooms shall be designed and constructed in accordance with Sections 706.3.1 through 706.3.8 and the International Building Code.

704.3.1 Design and construction. Interior building openings shall be equipped with self-closing devices. Interior openings shall be electronically interlocked with the gaseous hydrogen system to prevent operation of the system when such openings are ajar or the room shall be provided with a mechanical exhaust ventilation system designed with a capture velocity at the opening of not less than 60 fpm. Operable windows are prohibited in interior walls.

704.3.2-706.3.2 Ventilation. Cut-off rooms shall be provided with mechanical ventilation in accordance with the applicable provisions for repair garages in Chapter 5 of the International Mechanical Code.

Exception: This section shall not apply to rooms provided with ventilation systems meeting the requirements of Section 706.3.1.

704.3.3 706.3.3 Gas detection system. Hydrogen cut-off rooms shall be provided with an approved flammable gas detection system in accordance with Sections 706.3.3.1 through 706.3.3.3.

704.3.3.1 System design. The flammable gas detection system shall be listed for use with hydrogen and any other flammable gases used in the room. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammability limit (LFL) for the gas or mixtures present at anticipated temperature and pressure.

704.3.3.2 706.3.3.2 Operation. Activation of the gas detection system shall result in all of the following:

1. Initiation of distinct audible and visual alarm signals both inside and outside the cut-off room.

2. Activation of the mechanical ventilation system.

704.3.3.3 706.3.3.3 Failure of the gas detection system. Failure of the gas detection system shall result in activation of the mechanical ventilation system, cessation of hydrogen generation, and a trouble signal to sound in an approved location.

704.3.4 706.3.4 Ignition source control. Open flames, flame-producing devices and other sources of ignition shall be controlled in accordance with Chapter 35 of the International Fire Code.

704.3.5 706.3.5 Explosion control. Explosion control shall be provided in accordance with Chapter 9 of the International Fire Code.

704.3.6 706.3.6 Standby power. Mechanical ventilation and gas detection systems shall be connected to a standby power system in accordance with Chapter 27 of the International Fire Code.

704.3.7 706.3.7 Smoking. Smoking shall be prohibited in hydrogen cut-off rooms. “No Smoking” signs shall be provided at all entrances to hydrogen cut-off rooms.

704.3.8 706.3.8 Housekeeping. The hydrogen cut-off room shall be kept free from combustible debris and storage at all times.

SECTION 706 707 (IFGC)
OPERATION AND MAINTENANCE OF GASEOUS HYDROGEN SYSTEMS

706.4 707.1 Maintenance. Gaseous hydrogen systems and detection devices shall be maintained in accordance with the International Fire Code and the manufacturers installation instructions.

706.2 707.2 Purging. Purging of gaseous hydrogen systems shall be in accordance with Section 2210.8 of the International Fire Code.

SECTION 708 (IFGC)
DESIGN OF LIQUIFIED HYDROGEN SYSTEMS ASSOCIATED WITH HYDROGEN VAPORIZATION OPERATIONS

708.1 General. The design of liquefied hydrogen systems shall comply with Chapter 32 of the International Fire Code.

2. IFC 3501.1 Scope. The storage and use of flammable gases shall be in accordance with this chapter. Compressed gases shall also comply with Chapter 30.

Exceptions:
1. Gases used as refrigerants in refrigeration systems (see Section 606).

3503.1.1 Limitations for indoor storage and use. Flammable gases shall not be stored or used in Group A, B, E, F, I, M, R or S occupancies.

Exceptions:
1. Cylinders not exceeding a capacity of 250 cubic feet (7.08 m³) each at NTP used for maintenance purposes, patient care or motor fuel dispensing and operation of equipment.
2. Food service operations in accordance with Section 3803.2.1.
3. Hydrogen motor fuel dispensing stations designed and constructed in accordance with Chapter 22.

3. IBC

### TABLE 302.1.1 INCIDENTAL USE AREAS

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<th>ROOM OR AREA</th>
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<td>2-hour fire barriers and floor ceiling assemblies in Group A, E, I and R occupancies.</td>
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Commenter's Reason: The AHIC has addressed and resolved the technical issues identified by the Code Development Committee directly as modified by this and other coordinated public comments to all hydrogen-related proposals (F176, M7, FG2, FG15, FG41 & FG48). The supporting Reason to FG2-02 provides a brief explanation of each solution.
This proposal specifically, represents a compromise of sorts—consolidating all provisions associated with gasified hydrogen applications into a single, new Chapter 7 in the Fuel Gas Code.

The ICC AHC for Hydrogen Gas requests your Approval as Modified by this Public Comment (AMPC).

Public Comment 4:

Robert J. Davidson, South Brunswick Township Fire Safety Bureau, requests Disapproved for Item 2 only.

Commenter’s Reason: Hydrogen motor fuel is a new technology with no consumer site refueling experience. The IFC Development Committee voted to approve the new section of code in chapter 22 for this new technology, but specifically amended the proposal to restrict the operations to the exterior of structures in the interest of fire safety.

The IFGC Code Development Committee action on this item eliminated an important reference to NFPA 50A that applied to all hydrogen systems at consumer sites including numerous activities unrelated to the hydrogen fuel technology. This action appears to have been done without an understanding of the effect of the change on these other operations and with no technical basis for the change’s effect on other hydrogen system operations included in the submitted proposal.

The Committee action on this item needs to be overturned by Disapproving the proposal to provide for correlation with the action taken by the IFC Development Committee and to restore an important reference to NFPA 50A that is needed for regulation of hydrogen systems at all consumer sites.

Public Comment 5:

Jim Ranfone, American Gas Association, requests Disapproved for Item 1 only.

Commenter’s Reason: The American Gas Association (AGA) supports the IFGC Committee action for disapproval. In addition to the Committee Reason for disapproval documented in the Report on the Public Hearing, additional reasons addressed in the public hearing testimony by AGA and others include the following:

1.) The scope of the IFGC does not include hydrogen as a fuel gas and, based on existing coverage under IFGC Section 101.2, hydrogen proposals should be submitted to the International Mechanical Code (IMC).

2.) Provisions cited in the proposal referring to the International Fire Code (IFC) would be most appropriate to that code instead of the IFGC. Code coverage that simply refers to other code sections is redundant coverage.

3.) All proposed coverage of containers, cylinders, and vessels are outside the scope of the IFGC. The IFGC scope covers “fuel gas piping systems, fuel gas utilization equipment, and related accessories” as listed in Section 101.2. The proposal does not seek to modify the scope to add these components. Container and cylinder coverage needs to be proposed to the IFC, Chapter 35, which currently covers flammable gases containers and cylinders.

4.) The IFGC scope does not include coverage of ventilation systems for mitigating gaseous release hazards. Such systems, proposed as Section 702.1, should be covered under the IMC, may require unique requirements to address flammable concentrations and ignition source control within these ventilation systems.

5.) Requirements for design and installation of hydrogen piping systems to ASME B31.3 are unenforceable. While titled as a “code,” ASME B31.3 is, in fact, an engineering standard that presents numerous engineering options for design of process piping. This standard, according to its handbook is intended for chemical plants, oil refineries, loading terminals, bulk processing plants, and cryogenic piping and is an industrial standard intended to cover a wide variety of liquids and gases, hazardous and non-hazardous, at a variety of pressures. The standard provides no clear requirements of gaseous hydrogen systems. Likewise, it provides no clear requirements against which a code official can inspect a hydrogen piping system and judge it acceptable. The AHC should provide specific piping design and installation requirements for hydrogen systems in its proposal. It could then use ASME B31.3 to justify these requirements. There should be no requirement for code officials to secure copies of ASME B31.3 (currently costing $225 from ASME) to evaluate hydrogen piping systems and assume the role of a process engineer in an attempt to determine code compliance. It should be noted that industrial applications intended for ASME B31.3 were never covered by the IFGC or the NFPGC for natural gas. Those documents were targeted at code enforcement within residential and commercial applications. Industrial gas system requirements are conventionally the responsibility of process engineers working on plant design. Trying to apply an industrial standard to non-industrial installations is going the wrong direction.

6.) In addition, it is unclear whether ASME B31.3 is referenced in accordance with Section 3.6 of the Code Development Process for the International Codes maintained by the ICC. In particular, this standard appears to be referenced without an edition citation for specificity (Section 3.6.1). It also appears to include non-mandatory language, has insufficient description of test procedures and materials, and lacks clearly defined measurement of performance for leak testing (Section 3.6.2). Finally, AGA has found that the standard is not readily available (Section 3.6.3), except through purchase from ASME.

7.) The accompanying section on piping design and construction is, itself, unenforceable by requiring that the piping systems be “suitable for hydrogen service...through the full range of pressure and temperature to which they will be subjected.” This language, and the language that following the section, is performance language that requires engineering knowledge and judgment concerning behavior of the piping systems under operating and environmental conditions and the relative risk of failure. In other words, it requires a professional engineer to determine the applicability of a specific installation, not a typical code official.

8.) Requirements for joints, valves, gaskets, sealants and piping components to be “listed for hydrogen service” include no references to listing standards. As a result, these provisions are unenforceable and do not meet the requirements of the ICC for reference standards.

9.) Reference to ASME B31.3 for testing and inspection of hydrogen piping systems is ambiguous, unenforceable, and inappropriate. ASME B31.3 presents various options for pressure testing piping systems. It is unclear which method of test is preferred and whether all of the alternatives are equivalent for hydrogen systems. The pneumatic test, likely to be default method in the field, only requires pressurization to 110% of operating pressure and a piping inspection at this pressure. No information is provided on how the inspection is to be performed. If visual inspection is all that is required, the test might amount to a simple soap bubble test, but ASME B31.3 provides no information on this (presumably because of the wide range of applicability of the standard). Such interpretation of the requirement would be ironically lax, given the exhaustive deliberations over the IFGC coverage of pressure testing of natural gas and LP piping systems.

AGA supports the development of sound code or standards coverage of hydrogen and hydrogen systems under the ICC. AGA advocates the expeditious development of a separate, stand-alone code or standard for hydrogen systems. In order to maintain the integrity of ICC documents as model codes, proponents of code coverage for hydrogen and hydrogen systems need to address deficiencies identified in the current proposals.

Public Comment 6:
Larry Fluer, Fluer, Inc., requests Disapproved for Item 2 only.

Commenter’s Reason: The proposed code change deletes NFPA 50A Standard for Gaseous Hydrogen Systems at Consumer Sites, from the scope section of IFC Chapter 35. NFPA 50A was originally developed as a regulatory document in 1961. It has been used as a nationally recognized standard for more than forty years.

In substantiating the reason for the deletion of the requirements the proponent indicates that “Making gaseous hydrogen available, as motor vehicle fuel will likely require storage of that fuel gas in quantities beyond what is currently allowed by this section.”

Chapter 35 does not limit the quantity of hydrogen that can be stored or used. NFPA 50A provides standards for the installation of systems of various sizes including those (a) less than 3,500 cubic feet, (b) from 3,500 to 15,000 cubic feet and to ©) systems exceeding 15,000 cubic feet. There is no upper limit on the amount of hydrogen that is regulated by NFPA 50A. It should also be noted that liquefied hydrogen systems are regulated by IFC Chapter 32, and that Section 3201.1 requires liquid hydrogen systems to be in accordance with NFPA 50B Standard for Liquefied Hydrogen Systems at Consumer Sites. NFPA 50B applies to systems as large as 75,000 liquid gallons or approximately 8.5 million cubic feet of hydrogen gas. The reason to delete NFPA 50A as postulated by the proponent is not substantiated by the facts.

Further justification is offered by the proponent to indicate that IFC Chapter 22 Service Stations and Repair Garages should be used as the basis for regulating all hydrogen installations. The view taken by the Hydrogen Ad Hoc Committee (AHC) overlooks the fact that there are many hydrogen users within the industrial community. Hydrogen is commonly used by those engaged the electronics industry, semiconductor manufacturing, aerospace and allied industries, metal treating and others. While vehicle fueling may have special needs, provisions related to the use of hydrogen, as a vehicle fuel should not be used to regulate all other uses; and NFPA 50A should be retained.

IFC Section 3503.1 regulates the storage or use of hydrogen in quantities less than the Maximum Allowable Quantity per control area as listed in Section 2703.1. As proposed, Exception 3 to Section 3503.1.1 allows for the use of hydrogen motor fuel dispensing stations in quantities not exceeding the exempt amounts in Group A, B, E, F, I, M, R or S occupancies.

The exception is in conflict with the action taken by the IFC Code Change Committee on F176-02 which in Section 2209.3 requires generation, compression, storage and dispensing equipment to be located outdoors and above ground. One has to question the wisdom of allowing fuel dispensing stations in assembly, educational, institutional or other people intensive uses regardless of the quantities of gas involved. It may be appropriate to allow vehicle refueling limited to service stations and/or certain residential uses depending on the controls to be developed; however, as drafted the provisions are not properly focused.

FG48-02
707

Proposed Change as Submitted:

Proponent: Guy Tomberlin, Chair, ICC Ad Hoc Committee for Hydrogen Gas

Add new text as follows:

CHAPTER 8 (IFGC)
DESIGN OF LIQUEFIED HYDROGEN SYSTEMS ASSOCIATED WITH HYDROGEN VAPORIZATION OPERATIONS

801.1 General. The design of liquefied hydrogen systems shall comply with Chapter 32 of the International Fire Code.

Proponent’s Reason:

Introduction. Hydrogen energy safety is based on three primary elements: regulatory requirements, capability of safety technology and the systemic application of equipment and procedures to minimize risks. Groups involved in the industrial scale production of hydrogen (producers) currently implement many successful proprietary methodologies for safely generating and handling large amounts of hydrogen. Hydrogen users (e.g., NASA) depend on cryo-hydrogen as a fuel and have effectively proven the safety of large scale ground and vehicle systems which support the Space Shuttle Program.

The efforts of the International Code Council Ad Hoc Committee for Hydrogen Gas (AHC) intend to address how future building codes can safely cover hydrogen applications in fuel cell vehicles and hydrogen gas motor-vehicle fuel dispensing and generation stations. The AHC consists of a balanced membership of user, producer and regulatory interests working together with a diverse group of technical and advisory interests to propose changes as necessary to the ICC International Codes. This, and other, related proposals is a summation of their work.

IFGC Section 801.1. It is anticipated that large consumers of hydrogen as a fuel gas will ultimately utilize liquid hydrogen storage as the supply. While the storage, handling and vaporization of liquid hydrogen is no more technically sophisticated than the storage, handling and vaporization of liquefied petroleum gas (LPG) which the IFGC allows now, the design requirements for liquid storage, handling, and vaporizers are different from what is addressed in the AHC’s related proposal to Chapter 7. Therefore, the AHC believes that until the technology for bulk-commercial liquefied hydrogen refueling systems matures, the current edition of NFPA-50B will prove an effective resource for design guidance. It is envisioned that when such equipment is eventually provided for commercial or residential occupancies, it will be in the form of listed packages similar to LPG.

In Summary. The AHC has developed these changes through the consultation of a diverse group of technical and advisory parties from various parties in the hydrogen community, inclusive of industry, professional associations, testing laboratories, agencies of government, academic and research institutions and believes it important to provide a template for thorough coverage in the International Codes of equipment, appliances and vehicles that will utilize hydrogen as a fuel such that regulators have a sound technical basis on which to verify installation and to uphold the standard of health and safety for the citizens of their jurisdictions.

Industry is ready to commercialize hydrogen energy systems. The AHC urges your APPROVAL of this proposal “as submitted”

Committee Action: Disapproved

Committee Reason: Bulk storage coverage belongs in the IFC or a separate hydrogen code. FG2-02 did not include liquid hydrogen within its proposed text. There is no need for a Section 801.1 since the IFC contains all of the coverage. FG2-02 was disapproved therefore, the IFGC does not address liquid hydrogen. Refrigerated liquid hydrogen is beyond the scope of the IFGC.
Assembly Action: Approved as Submitted

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted and an assembly action was successful.

Public Comment 1:

ICC Ad Hoc Committee for Hydrogen gas requests Approved as Modified by this comment.

Modify proposal as follows:

**CHAPTER 8 SECTION 708 (IFGC)**
DESIGN OF LIQUIFIED HYDROGEN SYSTEMS ASSOCIATED
WITH HYDROGEN VAPORIZATION OPERATIONS

804-4 708.1 General. The design of liquefied hydrogen systems shall comply with Chapter 32 of the *International Fire Code*.

**Commenter’s Reason:** The AHC has addressed and resolved the technical issues identified by the Code Development Committee directly as modified by this and other coordinated public comments to all hydrogen-related proposals (F176, M7, FG2, FG15, FG41 & FG48). The supporting Reason to FG2-02 provides a brief explanation of each solution.

The ICC AHC for Hydrogen Gas requests your Approval as Modified by this Public Comment (AMPC).

Public Comment 2:

Jim Ranfone, American Gas Association, requests Disapproved.

**Commenter’s Reason:** Coverage of liquefied hydrogen and liquefied hydrogen systems is clearly outside the scope of the IFGC as written and as proposed for modification under FG02-02. Since the proposed text refers to the IFC, these requirements would be more appropriately proposed to that code. AGA supports the development of sound code or standards coverage of hydrogen and hydrogen systems under the ICC. AGA advocates the expeditious development of a separate, stand-alone code or standard for hydrogen systems. In order to maintain the integrity of ICC documents as model codes, proponents of code coverage for hydrogen and hydrogen systems need to address deficiencies identified in the current proposals.
Some of the proposed code changes and corresponding public comments include sections that are outside of the scope of the chapters or the code under which the code change was published. This is done in order to facilitate coordination among the International Codes which is one of the fundamental concepts of the International Codes.

Listed in this index are proposed code changes that include sections or codes other than those listed on page v of the 2002 Code Development Cycle Proposed Changes to the 2000 Editions of the International Codes (code change book). For example, IBC Section 414.6 is proposed for revision in code change F245-02. This proposal was originally heard by the International Fire Code Committee. A public comment has been submitted on F245-02 and the code change will be heard on the Final Action Agenda as part of the IFC agenda (see the tentative hearing order). Another example is Section R308.6.9 of the International Residential Code (IRC) which is a proposed new section in code change S186-02. Originally heard by the IRC Building/Energy Committee, the proposal was published as Part 4 with the IBC Structural code changes and will be heard on the Final Action Agenda as part of the IBC Structural agenda (see the tentative hearing order). In some instances there are other subsections that are revised by an identified code change that is not included in the list. For example, code change EC 18-02 would revise IRC Section N1101.3.2, as indicated on the IRC list, and would also change N1101.3.2.1 and N1102.3.2.2 which are not listed. This was done to keep the list brief enough for easy reference.

This information is provided to assist users in locating all of the proposed code changes that would affect a certain section or chapter. For example, to find all of the proposed code changes that would affect Chapter 7 of the IBC, review the proposed code changes in the Final Action Agenda for the IBC Fire Safety Committee (listed with a FS prefix) then review this cross reference for Chapter 7 of the IBC 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. This list includes all code changes submitted for the 2002 Cycle, not just the code changes which are on the Final Action Agenda.

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:

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